N60200.AR.009038
NAS CECIL FIELD
5090.3a

FOCUSED FEASIBILITY STUDY SITE 17 OPERABLE UNIT 2 (OU2) SOURCE CONTROL REMEDIAL ALTERNATIVES NAS CECIL FIELD FL

6/1/1993

ABB ENVIRONMENTAL

000458

15

FOCUSED FEASIBILITY STUDY
SITE 17, OPERABLE UNIT 2
SOURCE CONTROL REMEDIAL ALTERNATIVES

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT TASK ORDER NO. 090
CLEAN - DISTRICT I
CONTRACT NO. N62467-89-D-0317

JUNE 1993

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORTH CHARLESTON, SOUTH CAROLINA
29419-9010

U00458

FOCUSED FEASIBILITY STUDY
SITE 17, OPERABLE UNIT 2
SOURCE CONTROL REMEDIAL ALTERNATIVES

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Contract Task Order No. 090

Contract No. N62467-89-D-0317

Prepared by:

ABB Environmental Services, Inc.
2590 Executive Center Circle, East
Tallahassee, Florida 32301

Prepared for:

Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

Alan Shoultz, Engineer-in-Charge

June 1994

U00458

FOREWORD

The Department of the Navy developed the Installation Restoration (IR) program to locate, identify, and remediate environmental contamination from the past disposal of hazardous materials at Navy and Marine Corps installations. The Navy's IR program follows the Department of Defense's environmental restoration program mandated by the Superfund Amendments and Reauthorization Act of 1986 to address waste sites that may pose a threat to human health or the environment.

The Navy's IR program consists of Preliminary Assessment and Site Inspection, Remedial Investigation and Feasibility Study (RI/FS), and Remedial Design and Remedial Action at sites where hazardous materials were possibly disposed. The Preliminary Assessment and Site Inspection identify the presence of pollutants. The RI/FS analyzes the nature and extent of contamination and determines the optimum remedial solution. The Remedial Design and Remedial Action complete the implementation of the solution.

Previous investigations have determined that Naval Air Station (NAS) Cecil Field has 18 sites that may pose a threat to human health or the environment. Therefore, an RI/FS will be performed at each site to address the extent and magnitude of contamination at these sites.

This report documents the first phase of a Feasibility Study to address petroleum contaminated soils (partial source control) at Site 17 (Operable Unit 2 at NAS Cecil Field). This report is a Focused Feasibility Study and includes a discussion of remedial action objectives, applicable and/or relevant and appropriate requirements, the identification and screening of limited and applicable technologies to remediate petroleum contaminated soils, the identification and description of remedial alternatives for source control, and detailed analyses of the identified alternatives against nine criteria. A separate Feasibility Study addressing any remaining needs for source control and other contaminated media at the site will be conducted upon completion of hydrogeologic investigations at Site 17.

Questions regarding this report should be addressed to the Commanding Officer, Code OOB, P.O. Box 111, NAS Cecil Field, Jacksonville, Florida 32215-0111.

EXECUTIVE SUMMARY

ABB Environmental Services, Inc., has been contracted by the Department of the Navy, Southern Division, Naval Facilities Engineering Command to conduct an interim remedial action at Site 17 within Operable Unit 2 located at Naval Air Station (NAS) Cecil Field in Jacksonville, Florida. Site 17 is the former Oil and Sludge Disposal Area, Southwest, where waste oils, fuels, and grease were reportedly dumped in an unlined pit.

This report documents the first phase of the Feasibility Study (FS) being conducted to address contaminated soils acting as a source of groundwater contamination at Site 17 at NAS Cecil Field. A separate FS for Operable Unit 2 that addresses remaining wastes and contamination in the soil and other contaminated media at the site (i.e., groundwater) will be conducted upon completion of the remedial investigations and a baseline risk assessment at Site 17. This report is a Focused Feasibility Study (FFS) and, as such, includes a summary of remedial investigations and a discussion of remedial action objectives, applicable or relevant and appropriate requirements, the identification and screening of applicable technologies for remediation of petroleum contaminated soils, and the identification and detailed analyses of remedial alternatives for source control at Site 17.

Four alternatives have been proposed in this report to address the remediation of contaminated soils at Site 17. Each alternative offers a different approach to the remediation of the site. The following is a summary of these approaches for each alternative evaluated:

Alternative RA-1, excavation and offsite thermal treatment of contaminated soils;

Alternative RA-2, excavation and onsite thermal treatment of contaminated soils;

Alternative RA-3, excavation and onsite *ex-situ* biological treatment of contaminated soils; and

Alternative RA-4, *in-situ* biological treatment of contaminated soils.

The volume of soil to be remediated for this FFS is limited by contaminant concentration action levels developed in this FFS. The volume was calculated based on the chemical analysis of the 1991 Remedial Investigation (RI) and 1993 RI for Site 17. Estimated costs are based on these volume calculations.

U00458

TABLE OF CONTENTS

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Section	Title	Page No.
1.0	INTRODUCTION	1-1
1.1	THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA) FEASIBILITY STUDY (FS) PROCESS	1-1
1.2	SCOPE AND PURPOSE OF THE FOCUSED FEASIBILITY STUDY (FFS) FOR SITE 17	1-3
1.3	SITE 17 LOCATION, DESCRIPTION, AND HISTORY	1-4
1.3.1	Site Location	1-4
1.3.2	Site Description	1-4
1.3.3	Site History	1-4
1.3.4	Prior Investigations	1-4
1.3.4.1	Initial Assessment Study	1-4
1.3.4.2	Resource Conservation and Recovery Act (RCRA) Facility Investigation	1-5
1.3.4.3	Remedial Investigation (RI), 1991	1-5
1.3.4.4	Remedial Investigation, 1993	1-6
1.4	CHARACTERIZATION SUMMARY	1-6
2.0	IDENTIFICATION OF REMEDIAL ACTION OBJECTIVES	2-1
2.1	APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)	2-1
2.1.1	Definition of ARARs	2-1
2.1.2	Location-Specific ARARs	2-2
2.1.3	Chemical-Specific ARARs	2-2
2.1.4	Action-Specific ARARs	2-2
2.2	DISCUSSION OF REMEDIAL ACTION OBJECTIVES	2-5
2.2.1	Remedial Action Objectives	2-5
2.2.2	Soil Action Levels	2-10
3.0	IDENTIFICATION OF SOURCE CONTROL REMEDIAL ALTERNATIVES FOR SITE 17	3-1
3.1	IDENTIFICATION AND SCREENING OF REMEDIAL TECHNOLOGIES	3-1
3.2	IDENTIFICATION, SCREENING, AND DEVELOPMENT OF REMEDIAL ALTERNATIVES.	3-6
4.0	DETAILED ANALYSES OF ALTERNATIVES	4-1
4.1	ALTERNATIVE RA-1: EXCAVATION AND OFFSITE THERMAL TREATMENT OF CONTAMINATED SOIL	4-1
4.1.1	Description	4-1
4.1.2	Technical Criteria Assessment	4-8
4.2	ALTERNATIVE RA-2: EXCAVATION AND ONSITE THERMAL TREATMENT OF CONTAMINATED SOIL	4-9
4.2.1	Description	4-9
4.2.2	Technical Criteria Assessment	4-13

TABLE OF CONTENTS (Continued)

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Section	Title	Page No.
4.3	ALTERNATIVE RA-3: EXCAVATION AND ONSITE BIOLOGICAL TREATMENT OF CONTAMINATED SOIL	4-13
4.3.1	Description	4-13
4.3.2	Technical Criteria Assessment	4-18
4.4	ALTERNATIVE RA-4: *IN-SITU* BIOLOGICAL TREATMENT OF CONTAMINATED SOIL	4-20
4.4.1	Description	4-20
4.4.2	Technical Criteria Assessment	4-24
5.0	COMPARATIVE ANALYSES OF SOURCE CONTROL REMEDIAL ALTERNATIVES	5-1

REFERENCES

APPENDICES

Appendix A: 1993 RI Analytical Results
Appendix B: Background Inorganic Levels for Subsurface Soils at NAS Cecil Field
Appendix C: Soil Action Level Comparison Tables
Appendix D: Volume, Average Concentration, and Mass Calculations
Appendix E: Evaluation of Backfill Material Recontamination
Appendix F: Cost Estimation

LIST OF FIGURES

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Figure	Title	Page No.
1-1	Facility Map with Location of Site 17	1-2
1-2	Site 17 Surface Soil Sampling Locations, 0 to 2 feet Below Surface	1-7
1-3	Boring Locations	1-9
1-4	Monitoring Well Locations	1-14
1-5	Historical Water Levels, Wells CEF-17-1 and CEF-17-4S	1-17
1-6	Historical Water Levels, Wells CEF-17-5S and CEF-17-6S	1-18
1-7	TRPH Results, 0 to 2 Feet Below Land Surface	1-19
1-8	TRPH Results, 2 to 4 Feet Below Land Surface	1-20
1-9	TRPH Results, 4 to 6 Feet Below Land Surface	1-21
1-10	TRPH Results, 6 to 8 Feet Below Land Surface	1-22
2-1	Remedial Limits, 0 to 2 Feet Below Land Surface	2-14
2-2	Remedial Limits, 2 to 4 Feet Below Land Surface	2-15
2-3	Remedial Limits, 4 to 6 Feet Below Land Surface	2-16
2-4	Remedial Limits, 6 to 8 Feet Below Land Surface	2-17
2-5	Cross Section of Remedial Limits	2-18
4-1	Process Flow Diagram for Alternative RA-1, Excavation and Offsite Treatment of Contaminated Soil	4-2
4-2	Site Layout, Alternative RA-1	4-4
4-3	Process Flow Diagram for Typical Thermal Treatment Unit	4-6
4-4	Process Flow Diagram for Alterative RA-2, Excavation and Onsite Thermal Treatment of Contaminated Soil	4-11
4-5	Site Layout, Alternative RA-2	4-12
4-6	Process Flow Diagram for Alternative RA-3, Excavation and Ex-Situ Biological Treatment of Contaminated Soil	4-15
4-7	Site Layout, Alternative RA-3	4-17
4-8	Process Flow Diagram for Alternative RA-4, In-Situ Biological Treatment of Contaminated Soil	4-21
4-9	Typical Gas Monitoring Probes	4-23

LIST OF TABLES

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Table	Title	Page No.
1-1	1993 Remedial Investigation (RI) Analytical Summary Table, Surface Soils	1-8
1-2	1993 RI Analytical Summary Table, Screening Soil Borings	1-10
1-3	1993 RI Analytical Summary Table, Soil Borings	1-11
1-4	1993 RI Analytical Summary Table, Groundwater	1-15
2-1	Synopsis of Potential Federal Chemical-Specific Applicable or Relevant and Appropriate Requirements (ARARs)	2-3
2-2	Synopsis of Potential Federal and State Action-Specific ARARs	2-6
2-3	Summary of Exceedances of Potential Soil Action Levels	2-12
2-4	Summary of Organic Exceedances Outside Remedial Limits	2-19
3-1	Identification and Screening of Remedial Technologies	3-2
3-2	Identification of Remedial Alternatives	3-6
3-3	Development of Remedial Alternatives	3-7
3-4	Screening of Source Control Remedial Alternatives	3-9
4-1	Summary of Cost Estimate for Alternative RA-1: Excavation and Offsite Thermal Treatment of Contaminated Soil	4-10
4-2	Summary of Cost Estimate for Alternative RA-2: Excavation and Onsite Thermal Treatment of Contaminated Soil	4-14
4-3	Summary of Cost Estimate for Alternative RA-3: Excavation and Onsite Ex-situ Biological Treatment of Contaminated Soil	4-19
4-4	Summary of Cost Estimate for Alternative RA-4: In-situ Biological Treatment of Contaminated Soil	4-26
5-1	Comparative Analysis of Source Control Remedial Alternatives	5-2

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
ARARs	applicable or relevant and appropriate requirements
BTEX	benzene, toluene, ethylbenzene, and xylenes
bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm/s	centimeters per second
COCs	contaminants of concern
°F	degrees Fahrenheit
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FFS	Focused Feasibility Study
FID	flame ionization detector
FML	flexible membrane liner
FS	Feasibility Study
ft^2	square feet
ft/day	feet per day
kg	kilogram
GC	gas chromatograph
IAS	Initial Assessment Study
IR	Installation Restoration
IROD	Interim Record of Decision
ℓ	liter
MCL	maximum contaminant level
mg	milligram
mg/kg	milligrams per kilogram
mg/ℓ	milligrams per liter
μg/kg	micrograms per kilogram
μg/ℓ	micrograms per liter
NAPL	non-aqueous phase liquid
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
O&M	operation and maintenance
OU	Operable Unit

GLOSSARY (Continued)

PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RI/FS	Remedial Investigation/Feasibility Study
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SOUTHNAV-FACENGCOM	Southern Division, Naval Facilities Engineering Command
SVOCs	semivolatile organic compounds
TAL	target analyte list
TCE	trichloroethene
TCL	target compound list
TCLP	Toxicity Characteristic Leaching Procedure
TMSS	Technical Memorandum for Supplemental Sampling
TPH	total petroleum hydrocarbon
TRPH	total recoverable petroleum hydrocarbon
1,1,1-TCA	1,1,1-trichloroethane
USEPA	U.S. Environmental Protection Agency
VOA	volatile organic aromatics
VOCs	volatile organic compounds
VOH	volatile organic halocarbons
yd^3	cubic yards

1.0 INTRODUCTION

ABB Environmental Services, Inc. (ABB-ES), has been contracted by the Department of the Navy, Southern Division, Naval Facilities Engineering Command (SOUTHNAV-FACENGCOM) to complete a Remedial Investigation/Feasibility Study (RI/FS) for 18 sites at Naval Air Station (NAS) Cecil Field, Jacksonville, Florida (Figure 1-1). In some cases where there is an imminent threat to human health and the environment or a continuing source of contamination, an interim action is justified to address site contamination prior to completion of the final RI/FS. This report is a Focused Feasibility Study (FFS) and, as such, documents the identification and evaluation of remedial alternatives to support an interim remedial action for partial source control (i.e., control of contaminants from deposited wastes that may migrate and pose risks to human health and the environment) at Site 17, known as the Oil and Sludge Disposal Area, Southwest. Groundwater will be addressed as part of the overall FS for Operable Unit (OU) 2.

This report was prepared in accordance with the following guidance documents and regulations: the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) (references made to CERCLA in this report should be interpreted as "CERCLA, as amended by SARA"); the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (U.S. Environmental Protection Agency [USEPA], 1990); and *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (RI/FS guidance) (USEPA, 1988).

The remainder of this chapter provides an overview of the Feasibility Study (FS) process (Section 1.1) and discusses how this process will be implemented for Site 17 at NAS Cecil Field (Section 1.2). A site description and history of Site 17, including a discussion of previous investigations completed, is included in Section 1.3.

1.1 THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA) FEASIBILITY STUDY (FS) PROCESS. The development of remedial alternatives for CERCLA sites consists of identifying applicable technologies and developing those technologies into remedial alternatives that are then evaluated using nine criteria. SARA emphasizes the use of treatment technologies that reduce toxicity, mobility, or volume as a principal element rather than alternatives that prevent exposure to contaminants. The NCP requires that a range of alternatives be presented to the maximum practicable extent. However, USEPA has developed the FFS process to streamline the development of alternatives for interim remedial actions. The purpose of the FFS is to evaluate a limited number of remedial alternatives during detailed analysis. Evaluation of the no action alternative, typically required in an FS, is not necessary in an FFS because designation of a cleanup action as an interim remedial action implies that some action should be taken. To the extent practicable, a range of remedial alternatives are developed during the FFS and retained for detailed analysis.

Remedial alternatives are initially screened based on effectiveness, implementability, and cost. The purpose of screening is to minimize the number of alternatives that undergo detailed analysis. The alternatives remaining following screening are described and analyzed in detail against several factors, including:

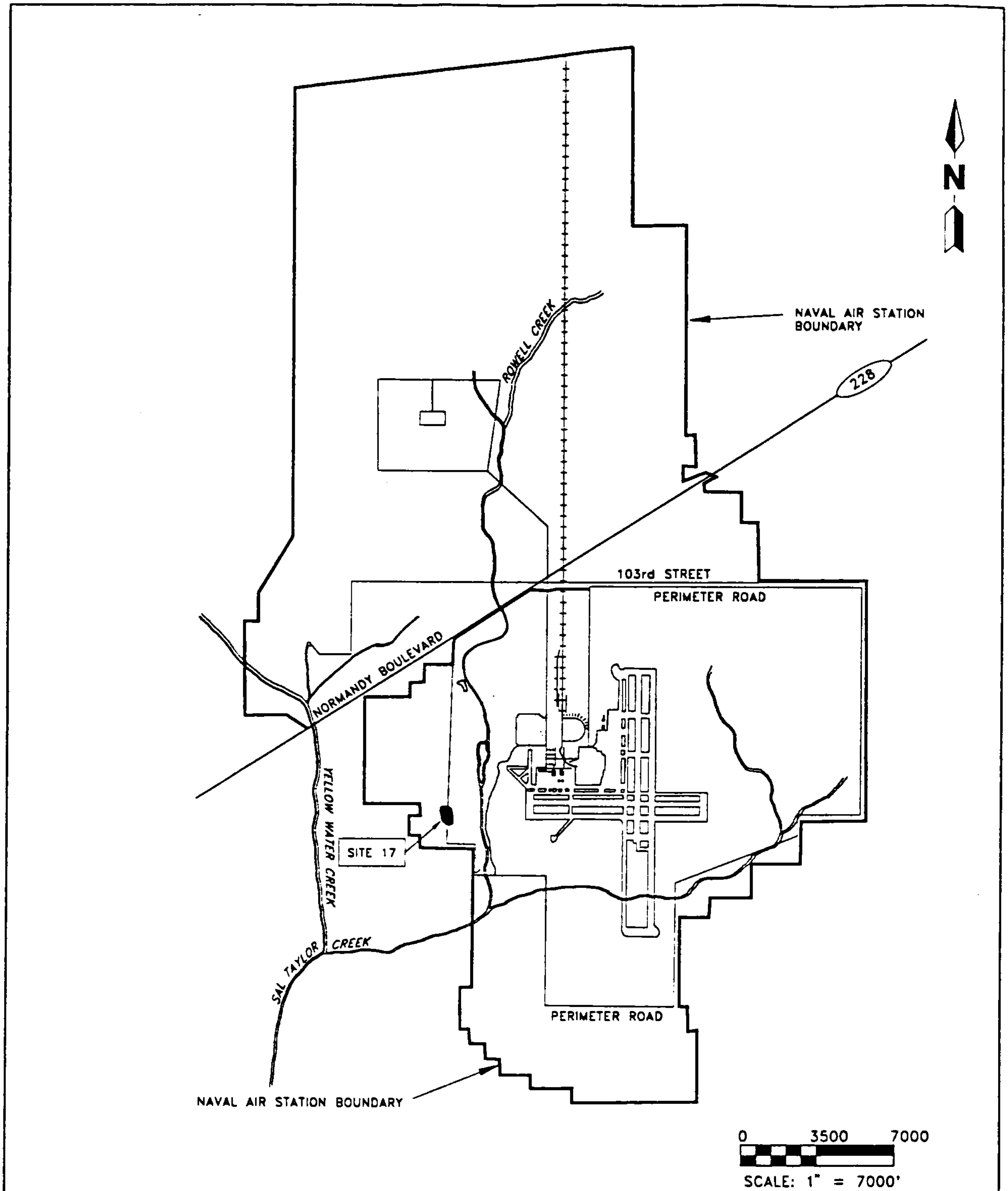


FIGURE 1-1
FACILITY MAP WITH LOCATION OF SITE 17

CECIL/FS/FS-FACIL.dwg/NP/3-19-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

in all media at the site and the need for additional remedial action to address such contamination will be evaluated.

The identification of ARARs and remedial action objectives for this remedial action at Site 17 are presented in Chapter 2.0. Chapter 3.0 presents the identification and screening of technologies chosen to meet the response objectives, and develops remedial alternatives from the applicable technologies that remain after screening. Chapter 4.0 presents the detailed analyses of the interim remedial action alternatives developed for Site 17. Chapter 5.0 provides a summary and comparative analysis of the alternatives described in Chapter 4.0.

1.3 SITE 17 LOCATION, DESCRIPTION, AND HISTORY. Site 17 is known as the Oil and Sludge Disposal Area, Southwest.

1.3.1 Site Location Site 17 is located east of Perimeter Road in the southwest part of NAS Cecil Field as shown in Figure 1-1. Site 17 is combined with Site 5 as OU 2 at NAS Cecil Field due to their proximity and similarity as waste oil and fuel disposal sites.

1.3.2 Site Description Site 17 covers an area of approximately 2 acres where liquid wastes consisting of waste oil and fuel were disposed in a pit and allowed to evaporate and drain into the soils. The waste disposal area reportedly was an unlined pit approximately 50 feet in diameter and 3 to 5 feet deep (Envirodyne Engineers, 1985). Visible staining of soils is evident at the site and a distinct petroleum odor exists when soils are disturbed. Site 17 is primarily vegetated with grasses and slash pines; however, areas of the site are void of vegetation. The site is flat and some ponding of water on the surface is evident during the wet seasons.

1.3.3 Site History Disposal was conducted at Site 17 for a 2- to 3-year period in the late 1960's or early 1970's. Liquid wastes from the fuel farm, aircraft intermediate maintenance department, squadrons, and public works were typically taken to the site in bowsers (portable storage tanks) or 55-gallon drums, drained into the pit, and allowed to seep into the soil or evaporate. Waste oil and fuel were reportedly disposed at the site. Solvents, paints, and paint thinners may have also been mixed with waste oils and disposed at the site; however, specific records of such disposal are not available (Envirodyne Engineers, 1985).

1.3.4 Prior Investigations Previous investigative activities completed at Site 17 include an Initial Assessment Study (IAS) (Envirodyne Engineers, 1985), a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) (Harding Lawson Associates, 1988), and an RI. The results of these investigations are discussed in the following subsections.

1.3.4.1 **Initial Assessment Study** The IAS was completed from 1984 to 1985 under the Department of the Navy's Installation Restoration (IR) program to identify hazardous waste sites at NAS Cecil Field that warrant further investigation. The IAS was completed through a records search of historical data, aerial photographs, site visits, and personnel interviews. No intrusive field investigations were conducted. Eighteen sites were identified during the IAS, including Site 17, the Oil and Sludge Disposal Area, Southwest. Site 17 was recommended for further studies (Envirodyne Engineers, 1985).

- overall protection of human health and the environment;
- compliance with applicable or relevant and appropriate requirements (ARARs);
- reduction of mobility, toxicity, or volume through treatment;
- long-term effectiveness and permanence;
- short-term effectiveness;
- implementability;
- economics;
- State acceptance; and
- community acceptance.

The results of the detailed analyses are summarized and compared in the comparative analysis. The alternatives are then compared with one another against five criteria the USEPA must consider during remedy selection. The five criteria include:

- protection of human health and the environment;
- attainment of Federal and State human health and environmental requirements identified for the site;
- cost effectiveness;
- use of permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable; and
- preference for treatment that reduces toxicity, mobility, or volume of contaminants as a principal element.

<u>1.2 SCOPE AND PURPOSE OF THE FOCUSED FEASIBILITY STUDY (FFS) FOR SITE 17</u>. The identification of remedial action objectives is the first step of the FFS process. Once these objectives are defined, remedial technologies are identified and screened as discussed in Section 1.1. This process provides the information and analyses that form the basis for a proposed remedial action plan and subsequent Interim Record of Decision (IROD), which documents the identification and selection of the interim remedy for Site 17. This FFS report presents the development, detailed analyses, and comparative analyses of remedial alternatives for controlling wastes deposited at Site 17.

Although all contamination in the soil and other contaminated media at the site are not addressed in this FFS, the remedial action objectives identified in this report are intended to be consistent with any remedy identified to complete remediation of contaminated media. Upon completion of the Remedial Investigation (RI) for OU 2 (which includes Site 17), the nature and extent of contamination

1.3.4.4 Remedial Investigation, 1993 Additional sampling and analytical efforts were performed at Site 17 in 1993. These activities included surface soil sampling, subsurface soil sampling, installation of additional monitoring wells, and groundwater sampling. All 1993 RI sampling has been completed at the site; however, validated results are not yet available for all samples. Data tables of complete 1993 RI validated data appear in Appendix A.

Surface Soil Sampling. Surface soil sampling consisted of collection of samples for both onsite and offsite analyses. Samples analyzed onsite were referred to as screening samples and were collected from 94 locations across a comprehensive grid covering the site on 40-foot centers. Figure 1-2 shows the grid spacing. Based on results of the screening, the locations for samples for offsite analysis, referred to as confirmatory samples, were selected. Fourteen surface soil locations were selected for confirmatory sampling. Samples were analyzed onsite for selected VOCs, SVOCs, and TRPH. Confirmatory samples were analyzed offsite for target compound list (TCL) VOCs, TCL SVOCs, TCL pesticides and polychlorinated biphenyls (PCBs), target analyte list (TAL) inorganics, and TRPH. Validated data for these samples were not available at the time this report was prepared. Table 1-1 presents a summary of surface soil screening sample results.

Subsurface Soil Sampling. Subsurface soil sampling consisted of collection of screening and confirmatory sampling in two stages. Initially, 20 soil borings were installed and 2 soil samples from different depths were analyzed from each boring. Figure 1-3 shows the boring locations. Twelve additional boring locations were selected for confirmatory sampling, and two samples were collected and analyzed from each boring. Figure 1-3 also shows the locations of confirmatory borings. Analyses performed were the same as for surface soil samples described above. Results have been received and validated for confirmatory samples and are included in Appendix A. Tables 1-2 and 1-3 present a summary of subsurface soil sample results.

Groundwater Screening and Installation of Monitoring Wells. The 20 screening borings mentioned for subsurface soils were extended into the aquifer and groundwater screening samples were collected from 4-foot zones at various depths to provide a better characterization of groundwater contamination. These samples were analyzed onsite for selected VOCs, SVOCs, and TRPH. Based on results of the groundwater screening samples, 13 additional monitoring wells were installed. Figure 1-4 shows the monitoring well locations. The new wells were installed to better characterize the extent of groundwater contamination around the site and provide a better characterization of groundwater contamination with depth in the center of the old disposal area. Analytical results from the five-well cluster in the center of the site are presented in Appendix A.

Groundwater Sampling. Groundwater samples were collected at each of the monitoring wells and analyzed for TCL VOCs, TCL SVOCs, TAL inorganics, and TRPH. Table 1-4 presents a preliminary summary of groundwater sample results.

1.4 CHARACTERIZATION SUMMARY.

Geology and Hydrogeology. The subsurface at Site 17 is composed primarily of sands and silty sands with lenses of cemented sands and silt encountered 22 feet bls and deeper. A dolomite layer exists approximately 102 feet bls with a clay

1.3.4.2 Resource Conservation and Recovery Act (RCRA) Facility Investigation Field investigations completed at Site 17 during the RFI in 1988 included a geophysical survey using a magnetometer, the installation of two monitoring wells, and sampling and analysis of groundwater from monitoring wells. The geophysical survey identified one anomalous area in the woods to the northeast of the site. No objects were observed on the surface in this area. During well installation, fine sands interbedded with silt layers were encountered. Groundwater samples were collected from the two new wells plus one existing well and analyzed for selected organics and metals. All parameters tested were below method detection limits (Harding Lawson and Associates, 1988).

1.3.4.3 Remedial Investigation (RI), 1991 Additional sampling of environmental media was conducted as part of an RI by ABB-ES during the fall of 1991 and spring of 1992. These investigations included: groundwater headspace screening, piezocone surveying, soil sampling, installation of additional monitoring wells, groundwater sampling, hydraulic conductivity testing, and collection of groundwater elevation data. The results from these investigations have been summarized in the *Technical Memorandum for Supplemental Sampling at Operable Units 1, 2, and 7* (TMSS) (ABB-ES, 1992). A synopsis of these activities for Site 17 is provided below.

Groundwater Headspace Screening. Five groundwater samples were collected from the soil and water interface. Headspace analyses were conducted by onsite gas chromatographs (GCs). The flame ionization detectors (FIDs) malfunctioned preventing analyses for some of the target compounds. Maximum concentrations of 1,1,1-trichloroethane (1,1,1-TCA) and trichloroethene (TCE) detected were 0.3 micrograms per liter ($\mu g/\ell$) and 44 $\mu g/\ell$, respectively.

Piezocone Survey. One piezocone sampling probe was installed to 8 feet below land surface (bls). Interpretation of piezocone data indicates silty to clayey fine sands, fine sand, and cemented sand to hardpan. Refusal of the cone was encountered in a fine sand unit.

Soil Sampling. Three soil borings were installed at Site 17 and two soil samples were collected from each boring. Samples were collected from 0 to 1 foot bls and 1 foot to 2 feet bls in each boring. A complete summary of analytical results is available in the TMSS (ABB-ES, 1992).

Installation of Monitoring Wells. Three monitoring wells were installed at Site 17 to monitor groundwater quality in the upper part of the surficial aquifer.

Groundwater Sampling and Analysis. Groundwater samples were collected from the three newly installed wells and one of the existing wells. A variety of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and total recoverable petroleum hydrocarbons (TRPH) were found in these samples. A complete summary of analytical results is available in the TMSS (ABB-ES, 1992).

Hydraulic Conductivity Testing and Water Level Elevations. Slug tests were performed in three wells at Site 17 to determine hydraulic conductivity. Average hydraulic conductivity for the upper surficial aquifer at Site 17 ranged from 1.84 feet per day (ft/day) to 3.94 ft/day. Water level measurements were collected in November 1991 and April 1992. Groundwater elevations at Site 17 are discussed in more detail in Section 1.4.

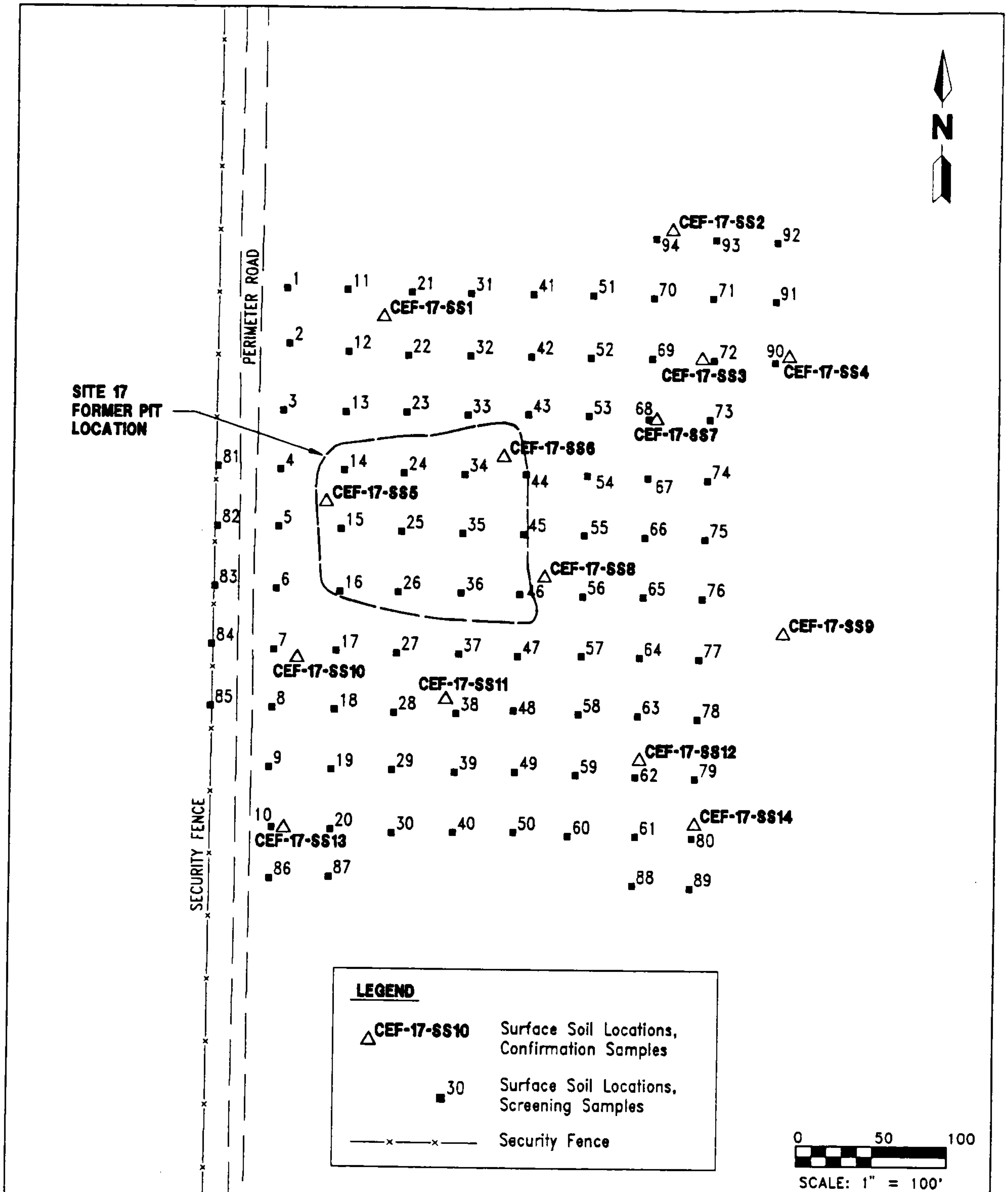


FIGURE 1-2
SITE 17 SURFACE SOIL SAMPLING LOCATIONS, 0 TO 2 FEET BELOW SURFACE

CECIL/FFS-S17

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Table 1-1
1993 Remedial Investigation (RI) Analytical Summary Table, Surface Soils

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florid

Location	Ethylbenzene	TRPH	1,2-Dichlorobenzene	1,1-Dichloroethylene
AGSS-17-4	–	8.3	–	–
AGSS-17-4D	–	4.1	–	–
AGSS-17-6	0.0039 DNC	170	–	–
AGSS-17-6D	0.0130 DNC	500	–	–
AGSS-17-8	–	92	–	–
AGSS-17-10	–	22	–	–
AGSS-17-12	–	6.2	–	–
AGSS-17-13	–	10	–	–
AGSS-17-23	–	630	–	–
AGSS-17-24	–	5.9	–	–
AGSS-17-27	–	24	–	–
AGSS-17-33	–	51	–	–
AGSS-17-37	–	46	–	–
AGSS-17-38	–	4.5	–	–
AGSS-17-39	–	11	–	–
AGSS-17-40	–	8.1	–	–
AGSS-17-44	–	680	–	–
AGSS-17-44D	–	18	–	–
AGSS-17-45	–	11,000	1.9 C	–
AGSS-17-46	–	9.5	–	–
AGSS-17-48	–	7.7	–	–
AGSS-17-53	–	9.5	–	–
AGSS-17-55	–	7.2	–	–
AGSS-17-56	–	4.6	–	–
AGSS-17-57	–	7.4	–	–
AGSS-17-61	–	–	–	0.0065
AGSS-17-62	–	–	–	0.011
AGSS-17-63	–	15	–	–
AGSS-17-64	–	3.5	–	–
AGSS-17-67	–	4.4	–	–
AGSS-17-69	–	11	–	–
AGSS-17-70	–	14	–	–
AGSS-17-92	–	15	–	–

Notes: Detections only are reported.
Analytical results have been validated.
Depth is 0 to 2 feet.
All concentrations are measured in milligrams per kilogram (mg/kg).
TRPH = total recoverable petroleum hydrocarbons.
DNC = did not confirm on second column analysis.
C = confirmed on second column analysis.
D = duplicate.

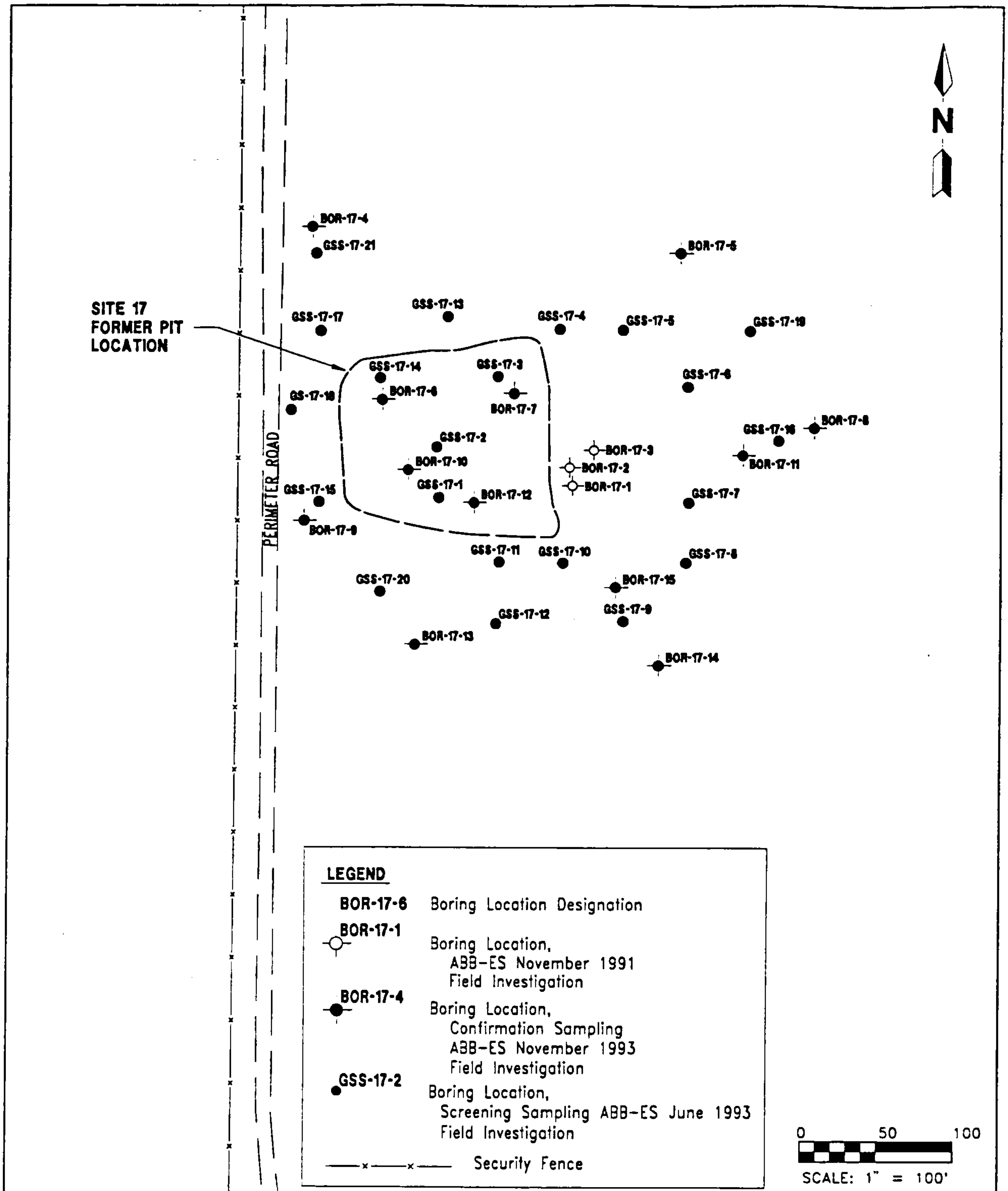


FIGURE 1-3
BORING LOCATIONS

FS-1_3/NP/3-15-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Table 1-2
1993 RI Analytical Summary Table, Screening Soil Borings

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Sample ID	Depth (feet)	Toluene	Ethyl-benzene	Total Xylenes	1,2-Dichloro-benzene	TRPH	1,1,1-Trichloro-ethane	Trichloro-ethene
GSS-17-1	0 to 2	–			0.0049 C	1,700	–	–
GSS-17-2	4 to 6	1.8 C	1.2 C	6.8 C	–	7,500	–	–
GSS-17-2D	4 to 6	2.3 C	1.5 C	9.1 C	–	1,700	–	–
GSS-17-2	6 to 8	–	–	–	–	130	–	–
GSS-17-3	4 to 6	2.3 C	1.3 C	6.8 C	0.33 C	5,800	–	–
GSS-17-3	6 to 8	0.62 C	0.37 C	2.1 C	–	1,800	–	–
GSS-17-6	6 to 8	–	–	–	–	5.4	–	–
GSS-17-7	0 to 2	–	–	–	–	12	–	–
GSS-17-8	0 to 2	–	–	–	–	3.5	–	–
GSS-17-11	4 to 6	–	–	–	–	4.6	–	–
GSS-17-11	6 to 8	0.004	–	–	–	–	–	–
GSS-17-14	6 to 8	–	0.0058 DNC	0.3 C	0.0057 C	18	–	0.0025 DNC
GSS-17-15	4 to 6	–	–	–	–	57	–	–
GSS-17-15D	6 to 8	–	–	–	–	3.8	–	–
GSS-17-16	0 to 2	–	–	–	–	8.7	–	–
GSS-17-17	2 to 4	–	–	–	–	–	0.0028 DNC	–

Notes: Table presents summary of hits only.
All concentrations are in milligrams per kilogram (mg/kg).
Analytical results have been validated.
D = duplicate.
TRPH = total recoverable petroleum hydrocarbons.
C = confirmed on second column analysis.
DNC = did not confirm on second column analysis.

Table 1-3
1993 RI Analytical Summary Table, Soil Borings

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Sample ID:	BOR-17-4	BOR-17-4	BOR-17-5	BOR-17-5	BOR-17-6	BOR-17-6	BOR-17-7	BOR-17-7	BOR-17-8	BOR-17-8	BOR-17-9	BOR-17-9
Depth (feet):	0 to 2	2 to 4	0 to 2	2 to 4	0 to 2	2 to 4	0 to 2	2 to 4	0 to 2	2 to 4	0 to 2	2 to 4
Chemical												
Methylene chloride	--	--	0.003 J	--	0.004 J	--	--	--	--	0.004 J	--	--
Acetone	--	--	0.16 J	--	--	1.7 J	1.6	1.6	5.7 J	0.18 J	--	--
Toluene	--	--	--	--	--	--	1.4	0.59 J	--	--	--	--
2-Butanone	--	--	--	--	--	--	--	--	--	0.004 J	--	--
Ethylbenzene	--	--	--	--	--	--	1.4	0.53 J	--	--	--	--
Xylenes (total)	--	--	--	--	--	--	10	4.2	--	--	--	--
Phenol	--	--	--	--	--	0.036 J	--	--	--	--	--	--
1,2-Dichlorobenzene	--	--	--	--	--	0.12 J	--	--	--	--	--	--
2-Methylphenol	--	--	--	--	--	0.13 J	--	--	--	--	--	--
4-Methylphenol	--	--	--	--	--	0.1 J	--	--	--	--	--	--
Naphthalene	--	--	--	--	--	--	1.5 J	15	--	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--	3 J	42	--	--	--	--
Dibenzofuran	--	--	--	--	--	--	--	1.6	--	--	--	--
Diethylphthalate	--	--	--	--	--	0.028 J	--	--	--	--	--	--
Di-n-butylphthalate	--	--	0.026 J	0.036 J	--	--	0.073 J	--	0.037 J	0.1 J	--	0.060 J
Fluoranthene	--	--	--	--	--	--	--	0.8 J	--	--	--	--
bis(2-Ethylhexyl) phthalate	0.037 J	0.039 J	0.028 J	0.028 J	0.11 J	0.12 J	0.11 J	--	0.096 J	0.063 J	0.083 J	0.025 J
Aldrin	--	--	--	--	--	--	--	--	--	0.0023 J	--	--
4,4-DDE	--	--	--	--	--	--	0.055 J	--	--	--	0.00044 J	--
Aluminum	1,320	1,060	1,730	1,350	1,070	987	564	928	5,050	4,430	1,440	1,170
Barium	--	--	--	--	--	3.5	1.6 J	--	9.5	54	--	--
Calcium	38,000	292	185	107	1,150	503	1,130	653	1,430	247	7,530	741
Chromium	--	--	--	3.2 J	2.6 J	2.5 J	--	6.6 J	4.8 J	3.5 J	3.1 J	5 J
Copper	--	--	--	--	--	4.6	--	--	--	--	--	--
Iron	279	162	198	140	180	167	116	120	699	208	198	92.6
Lead	2.3	0.89	1.7	0.74	4.7	2.5	9.9	20.1	10.2	2.3	2 J	0.91 J
Magnesium	2,890	--	--	--	--	89	--	--	134	--	75.2	--
Manganese	6.7 J	--	--	--	--	5.6 J	12.6 J	29.5 J	8.1 J	--	4.1	--
Sodium	198	148	187	146	131	158	160	153	252	220	149	170
Thallium	0.24	--	--	--	--	--	0.25	0.27	--	--	--	--
Vanadium	1.5	0.99	1.5	1	0.85 J	0.74	1	0.95	3.5	1.6	1.6	6.2
Zinc	--	--	--	--	--	20.7 J	--	--	--	6.6	--	--
TRPH	680	110	--	--	810	330	480	5,900	--	--	44	--

See notes at end of table.

Table 1-3 (Continued)
1993 RI Analytical Summary Table, Soil Borings

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Sample ID:	BOR-17-10	BOR-17-10	BOR-17-11	BOR-17-11	BOR-17-12	BOR-17-12	BOR-17-13	BOR-17-13	BOR-17-14	BOR-17-14	BOR-17-14D	BOR-17-16
Depth (feet):	0 to 2	2 to 4	0 to 2	2 to 4	0 to 2	2 to 4	0 to 2	2 to 4	0 to 2	2 to 4	2 to 4	0 to 2
Chemical												
Methylene chloride	0.003 J	--	0.012 J	0.012 J	--	0.35 J	--	--	0.004 J	--	--	--
Acetone	--	3.9	0.39 J	0.38 J	2	1.2 J	6.5 J	1.1 J	--	0.96 J	0.59 J	1 J
Toluene	--	1.4	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	--	--	--	--	--	0.3 J	--	--	--	--	--	--
Ethylbenzene	--	0.58 J	--	--	--	--	--	--	--	--	--	--
Xylenes (total)	--	14	--	--	--	1.1 J	--	--	--	--	--	--
1,3-Dichlorobenzene	--	0.92 J	--	--	--	--	--	--	NA	--	--	--
1,4-Dichlorobenzene	--	0.73 J	--	--	--	--	--	--	NA	--	--	--
1,2-Dichlorobenzene	0.068 J	18 J	--	--	--	--	--	--	NA	--	--	--
Naphthalene	--	19 J	--	--	0.021 J	--	--	--	NA	--	--	--
2-Methylnaphthalene	--	47 J	--	--	0.044 J	--	--	--	NA	--	--	--
Dibenzofuran	--	1.9 J	--	--	--	--	--	--	NA	--	--	--
Hexachlorobenzene	--	--	--	--	0.1 J	--	--	--	NA	--	--	--
Di-n-butylphthalate	--	--	0.075 J	0.091 J	--	--	0.064 J	--	NA	--	--	--
Fluoranthene	--	--	--	--	0.031 J	--	--	--	NA	--	--	--
Pyrene	--	--	--	--	0.031 J	--	--	--	NA	--	--	--
Chrysene	--	--	--	--	0.025 J	--	--	--	NA	--	--	--
bis(2-Ethylhexyl) phthalate	0.076 J	--	0.03 J	0.13 J	0.16 J	--	0.021 J	0.034 J	NA	0.088 J	0.046 J	0.048 J
Benzo(b)fluoranthene	--	--	--	--	0.037 J	--	--	--	NA	--	--	--
Alpha-BHC	--	--	0.00062 J	--	--	--	--	--	NA	--	--	--
Endosulfan II	--	--	--	--	0.00044 J	--	--	--	NA	--	--	--
Methoxychlor	--	--	--	--	--	--	0.0034 J	0.0016 J	NA	--	--	--
Aluminum	776	806	2,460	5,140	820	876	994	2,270	2,210	2,640	3,170	1,500
Barium	4.6	--	9.7	7.5	--	--	--	--	--	--	--	--
Calcium	924	318	2,100	752	53,000	414	222	121	1,620	266	309	291
Chromium	8.5 J	7.2 J	--	--	--	5 J	2.7 J	3.9 J	--	--	6.6	--
Copper	1.9 J	--	--	--	--	--	--	--	--	--	--	--
Iron	169	128	750	451	177	128	176	207	380	194	243	223
Lead	9.3	20.9	15.2	4.3 J	7.1	7.4	2.3	2	3 J	2 J	1.9 J	1.6 J
Magnesium	--	--	--	--	345	--	--	--	--	--	--	--
Manganese	112 J	77.9 J	--	--	4.9 J	14.9 J	--	--	--	--	--	--
Sodium	155	169	202	233	146	161	164	167	210	152	152	165

See notes at end of table.

00458

Table 1-3 (Continued)
1993 RI Analytical Summary Table: Soil Borings

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Sample ID:	BOR-17-10	BOR-17-10	BOR-17-11	BOR-17-11	BOR-17-12	BOR-17-12	BOR-17-13	BOR-17-13	BOR-17-14	BOR-17-14	BOR-17-14D	BOR-17-15
Depth (feet):	0 to 2	2 to 4	0 to 2	2 to 4	0 to 2	2 to 4	0 to 2	2 to 4	0 to 2	2 to 4	2 to 4	0 to 2
Chemical												
Thallium	--	--	0.42 J	0.43 J	--	--	--	--	0.28 J	0.23	--	--
Vanadium	--	0.82	--	--	1.3	--	0.54 J	1.4	--	--	--	--
Zinc	--	--	1.4 J	2.3 J	--	--	--	--	6.8 J	--	--	--
TRPH	540	9,200	--	--	1,500	910	15	--	--	--	--	--

Sample ID:	BOR-17-15D	BOR-17-15	BOR-17-15D
Depth (feet):	0 to 2	2 to 4	2 to 4
Chemical			
Acetone	0.65 J	3 J	2.3 J
1,4-Dichlorobenzene	0.02 J	--	--
bis(2-Ethylhexyl) phthalate	0.089 J	0.15 J	0.27 J
Aluminum	1,820	2,190	2,260
Calcium	223	--	204
Iron	242	240	315
Lead	1.6	1.6 J	2.3 J
Sodium	222	285	326
Zinc	--	--	1.7 J
TRPH	--	--	--

Notes: Detections only are reported.
All concentrations are in milligrams per kilogram (mg/kg).
Analytical results have been validated.
4,4-DDE = 4,4-dichlorodiphenyldichloroethene.
TRPH = total recoverable petroleum hydrocarbons.
Alpha-BHC = Alpha-benzene hexachloride.
D = duplicate.
J = estimated.
NA = data not available at time of preparation of this report.

000458

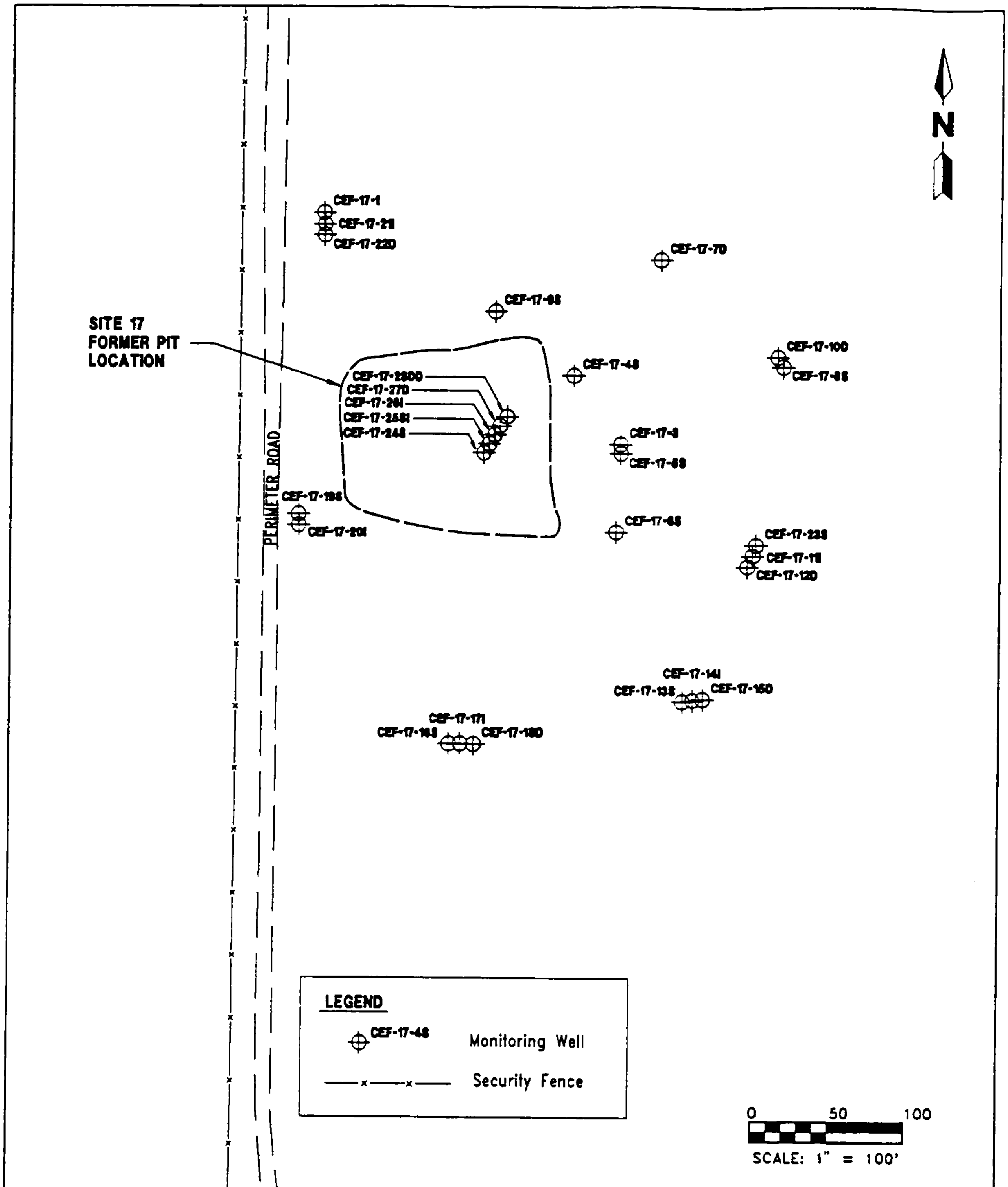


FIGURE 1-4
MONITORING WELL LOCATIONS

CECIL/FS-1_4/05/10/94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Table 1-4
1993 RI Analytical Summary Table, Groundwater

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Sample ID	Toluene	Phenol	bis(2-Ethylhexyl) phthalate	Diethyl-phthalate	Di-n-butyl-phthalate	4-Methyl-phenol	TRPH
CEF-17-1	–	–	–	–	–	–	-
CEF-17-4S	0.004	–	–	–	–	0.085	1.2
CEF-17-5S	0.019	0.15	–	–	–	3.4	0.5
CEF-17-6S	0.014	–	–	–	–	–	1.3
CEF-17-7D	–	0.002	0.006	–	–	–	0.6
CEF-17-9S	–	–	–	–	–	–	–
CEF-17-10D	–	0.001	–	–	–	–	–
CEF-17-11I	–	0.0009	–	0.0008	–	–	0.7
CEF-17-12D	–	0.0008	0.0005	–	–	–	–
CEF-17-13S	–	0.002	0.0008	–	–	–	0.5
CEF-17-14I	–	0.0008	0.004	–	–	–	–
CEF-17-15D	–	0.0007	0.0008	–	–	–	0.5
CEF-17-16S	–	0.001	–	–	–	–	–
CEF-17-17I	–	0.006	0.001	0.0008	0.0008	–	0.6
CEF-17-18D	–	0.007	–	–	0.0006	–	0.6
CEF-17-19S	–	0.0005	–	–	–	–	
CEF-17-20I	–	0.002	–	–	–	–	0.5
CEF-17-20ID	–	0.001	–	–	–	–	0.5
CEF-17-21I	–	–	–	–	–	–	–
CEF-17-22D	–	0.005	–	–	–	–	–
CEF-17-23S	0.015	–	–	–	–	0.0007	–
CEF-17-24S	–	R	R	R	R	R	–
CEF-17-25SI	–	–	.0006	–	–	–	–
CEF-17-26I	–	–	–	–	–	–	–
CEF-17-27D	–	–	–	–	–	–	–
CEF-17-28DD	–	–	–	–	–	–	–

Notes: Table presents preliminary results only. Complete evaluation of groundwater analyses will be included in the Operable Unit 2 RI report.
Detections only are reported.
All concentrations are in milligrams per liter (mg/ℓ).
Analytical results have not been validated.
TRPH = total recoverable petroleum hydrocarbons.
R = rejected.

unit approximately 32 feet in thickness overlying the dolomite. The surficial aquifer extends from the water table to the clay unit.

Slug tests in wells positioned in the upper surficial aquifer determined hydraulic conductivities for the soils ranging from 1.84 ft/day to 3.94 ft/day ($6.49x10^{-4}$ to $1.39x10^{-3}$ centimeters per second [cm/s]). The elevation of the groundwater table is highly seasonable ranging from 3 feet bls to 7 feet bls. Figures 1-5 and 1-6 show groundwater elevation data collected at the Site relative to land elevation. The fluctuating groundwater table and the lack of a consistent gradient has prevented the interpretation of a definite and consistent direction of groundwater flow. Groundwater contamination shows some indication that groundwater is moving to the southeast.

Soil Contamination. Soils have been sampled and analyzed from the surface to 8 feet bls. The following paragraphs describe analytical results in this zone. Soil contamination below 8 feet exists below the groundwater table and is not addressed in this evaluation because groundwater remediation is not part of this interim remedial action and will be addressed in a subsequent RI/FS.

Soils contain organics typical of fuels (e.g., toluene, ethylbenzene, and xylenes) and aged waste oils. In addition, several samples have included detections of chlorinated organics; however, the low concentrations present suggest these were not disposed in large quantities at the site. Methylene chloride was reported in samples from soil borings installed during the 1991 RI in relatively high concentrations (29 and 58 milligrams per kilogram [mg/kg] in two separate samples). During the 1993 RI, methylene chloride was encountered again, but in much lower concentrations (0.35 mg/kg maximum).

TRPH results present the best characterization of the extent of contamination at Site 17. TRPH results indicate that residual soil contamination remains and extends down to 8 feet bls in the abandoned pit area. Surface soil TRPH results indicate that residual contamination extends outward from the abandoned pit. Figures 1-7 through 1-10 show the extent of TRPH contamination at different depths.

Inorganic subsurface soil concentrations were compared with the background concentrations established for NAS Cecil Field (Appendix B). The inorganic concentrations of samples at Site 17 were compared with two times the average detected concentrations in background samples for NAS Cecil Field. One sample with barium, 15 with calcium, 1 with chromium, 4 with copper, 4 with lead, 2 with magnesium, 6 with manganese, and 1 with sodium contained concentrations that exceeded two times the background average.

Inorganic concentrations are lower than would be necessary for soils to show a hazardous waste characteristic based on metals (i.e., would fall below Toxicity Characteristic Leaching Procedure [TCLP] regulatory levels).

Historical records do not document any disposal of wastes at Site 17 that are classified as listed wastes under RCRA. There are suggestions of potential disposal of solvents at the site and the detection of chlorinated organics suggests that this may have occurred (Envirodyne Engineers, 1985); however, sample results do not indicate that disposal of solvents was ever a major activity at Site 17. If spent solvents were disposed at the site, specific records of the types and concentrations of these solvents are not available.

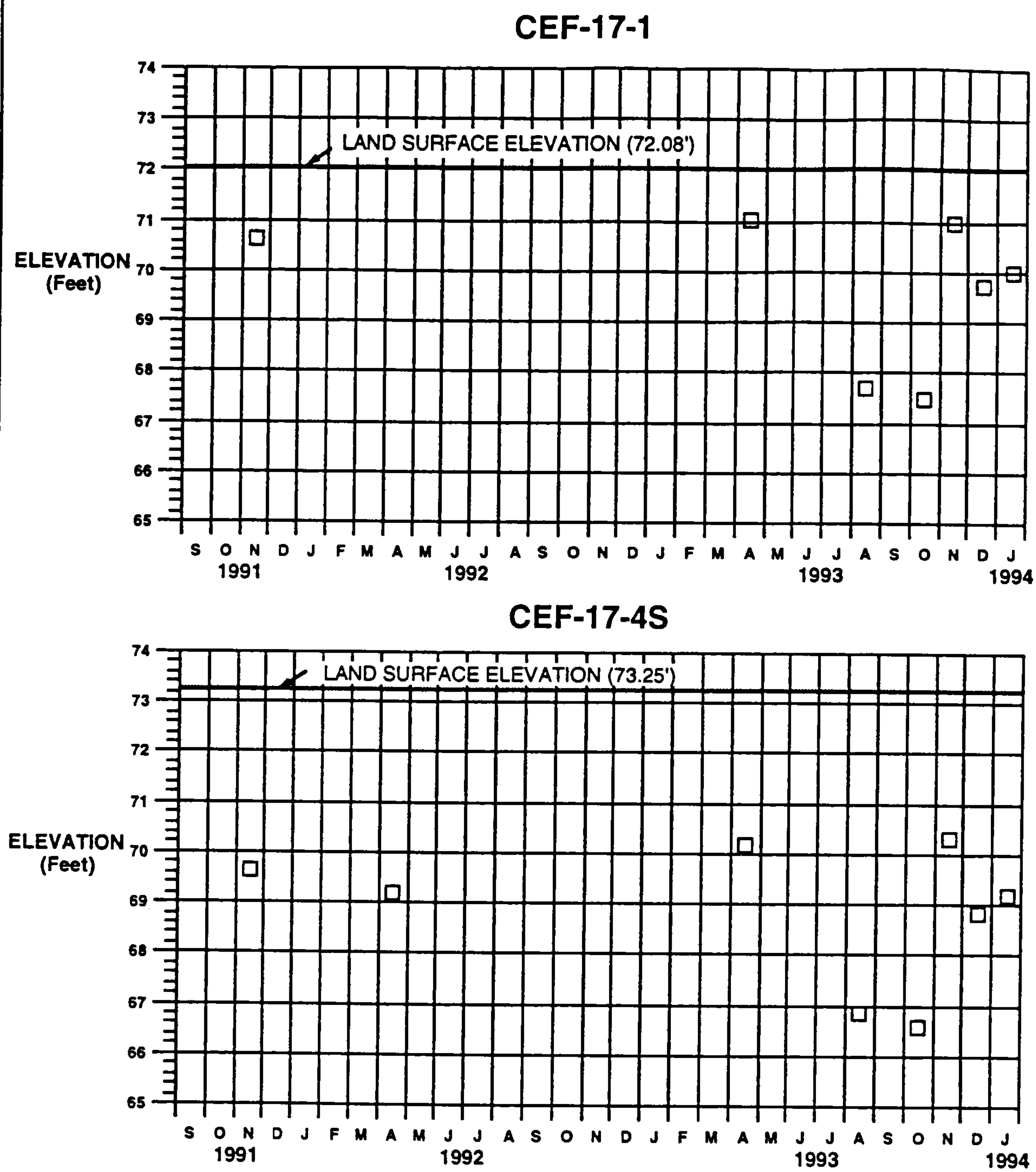


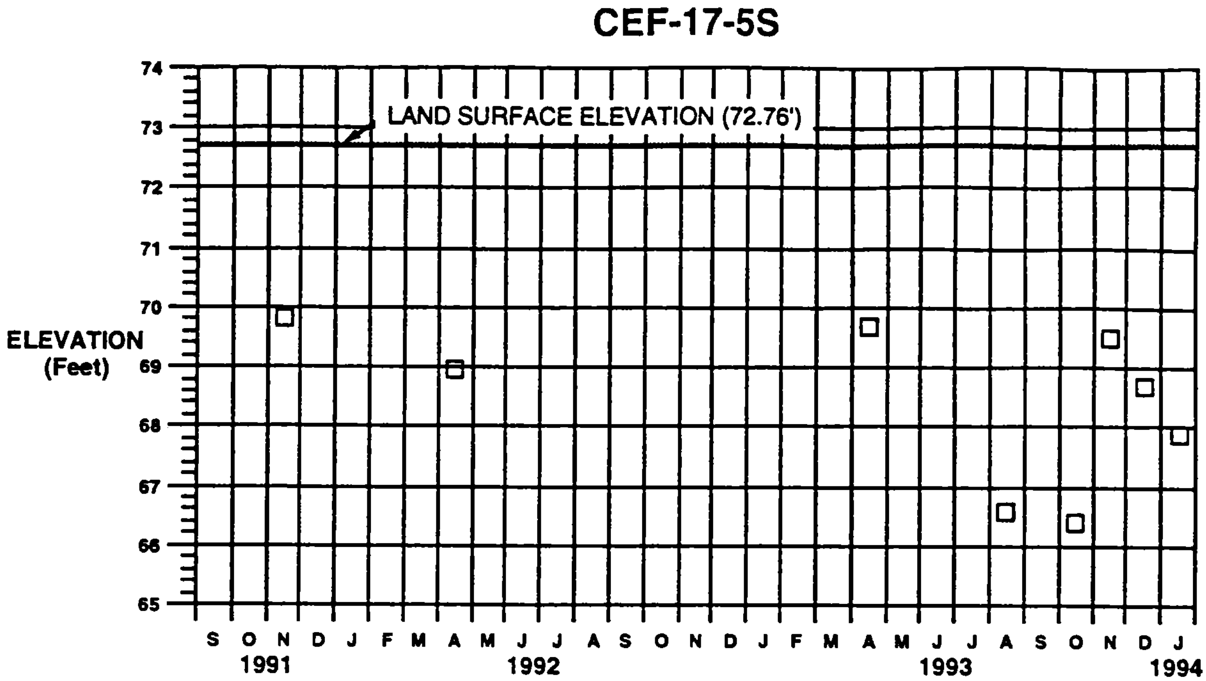
FIGURE 1-5

HISTORICAL WATER LEVELS, WELLS CEF-17-1 AND CEF-17-4S

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

8520-26 940323WEM



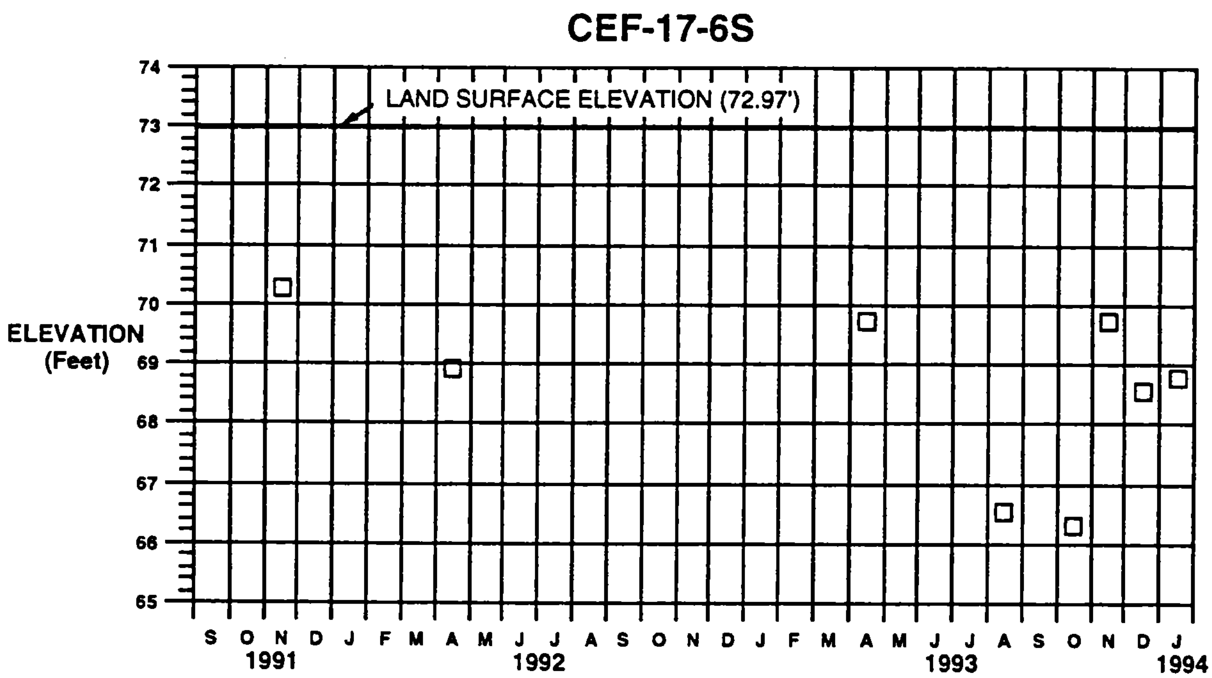


FIGURE 1-6

HISTORICAL WATER LEVELS, WELLS CEF-17-5S AND CEF-17-6S

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

8520-26 940323WEM

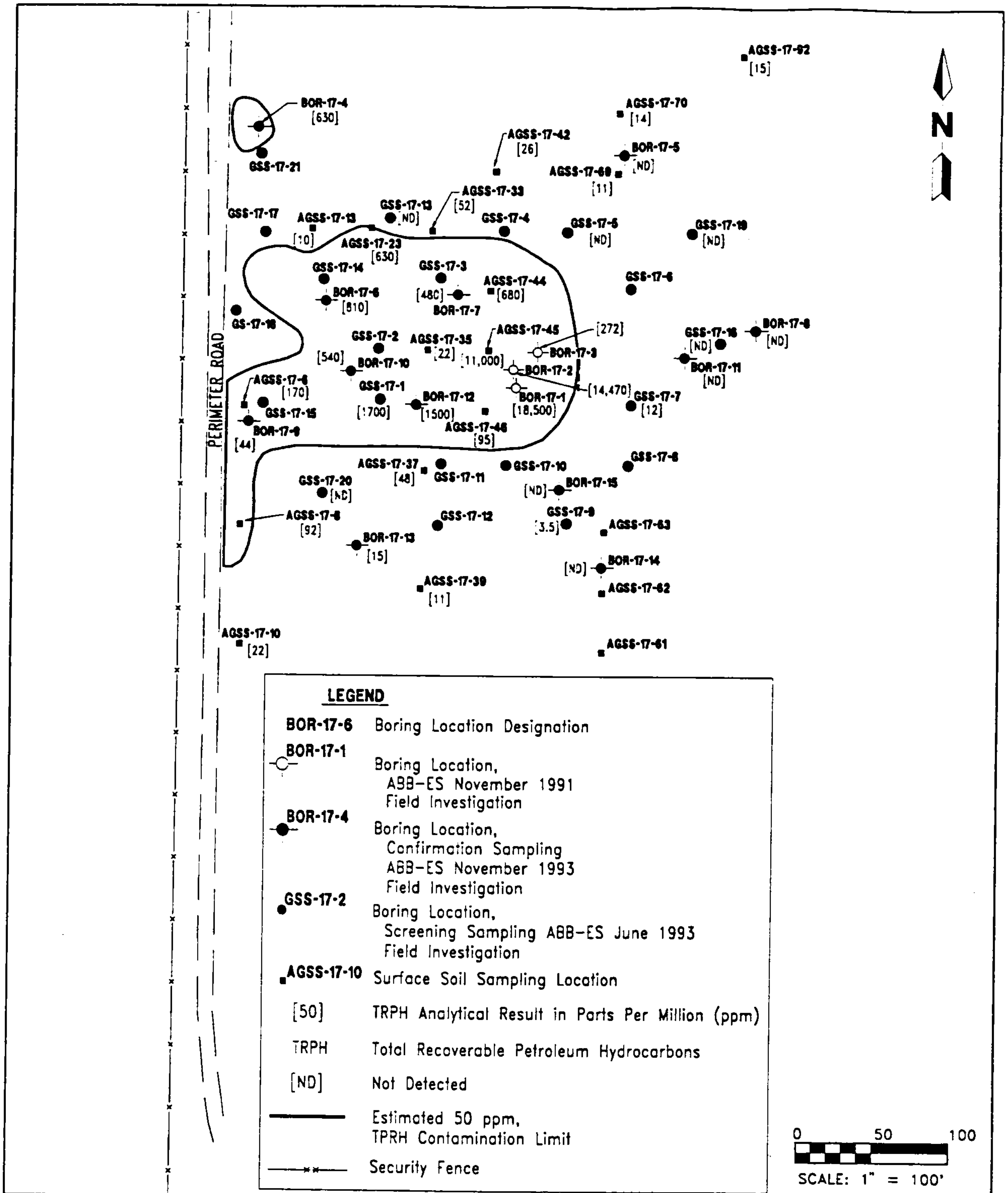


FIGURE 1-7
TRPH RESULTS,
0 TO 2 FEET BELOW LAND SURFACE

CECIL/FFS/FS-1_7.dwg/NP/3-25-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

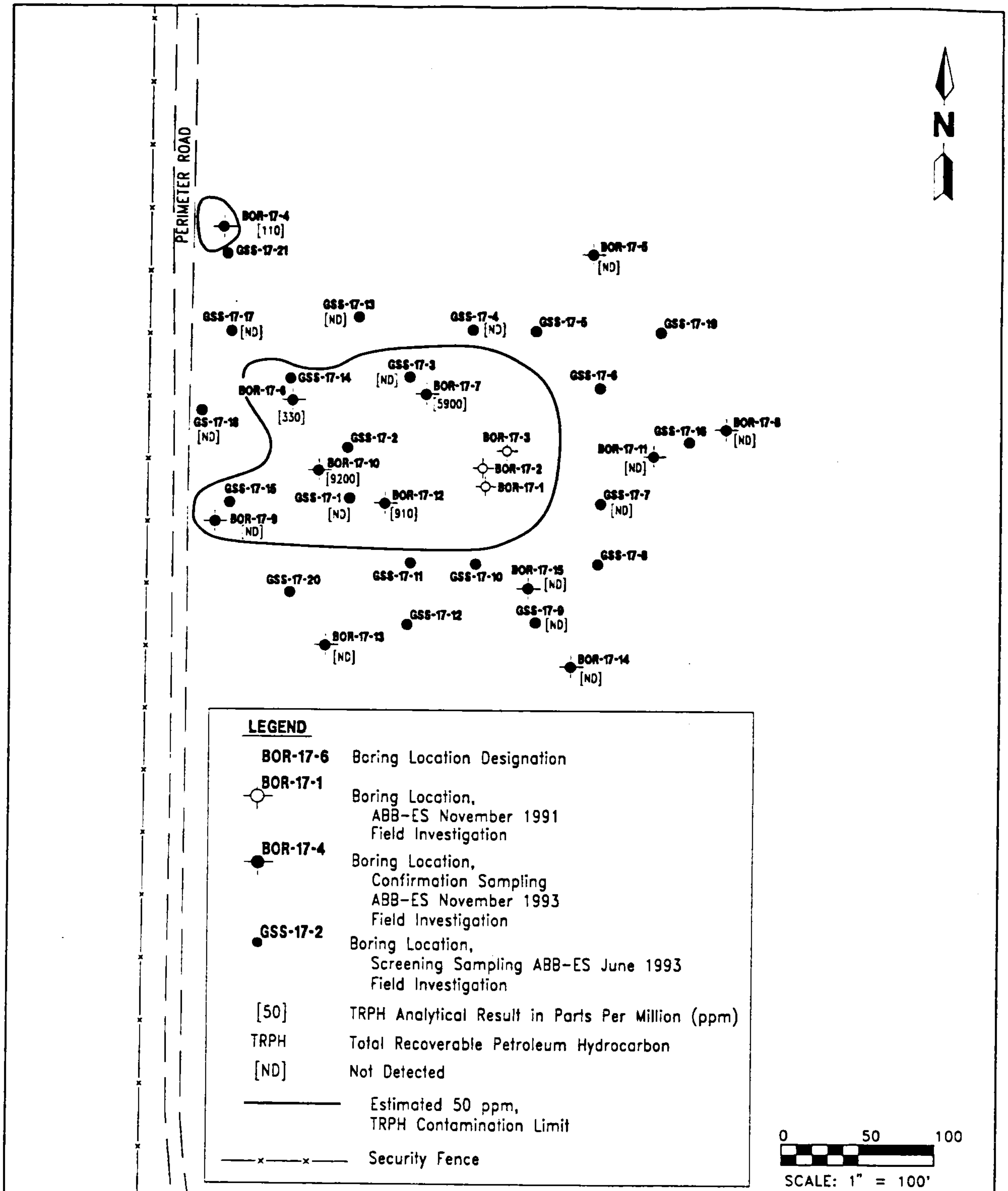


FIGURE 1-8
TRPH RESULTS,
2 TO 4 FEET BELOW LAND SURFACE

CECIL/FFS/FS-1_8.dwg/NP/3-23-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

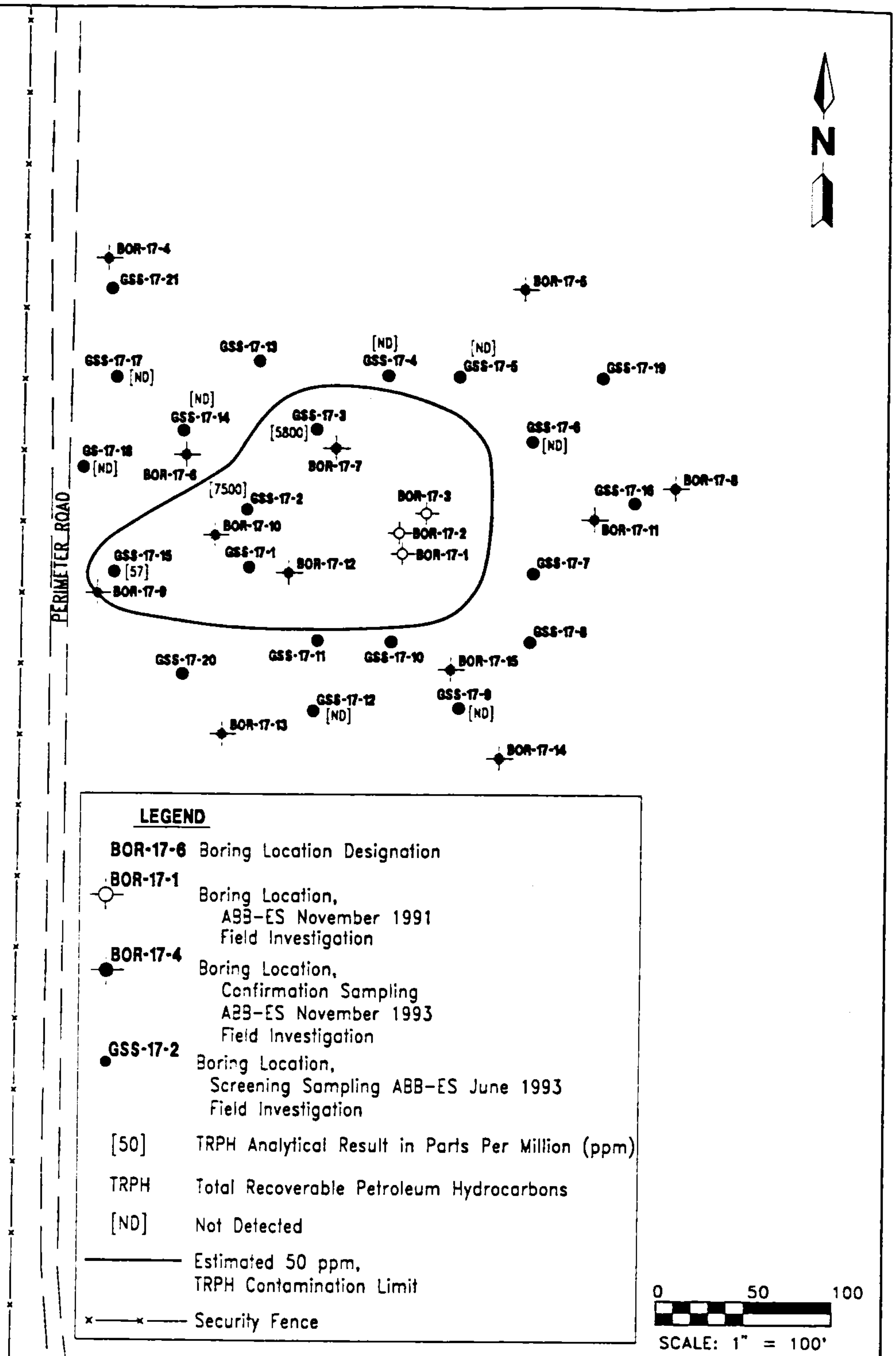


FIGURE 1-9
TRPH RESULTS,
4 TO 6 FEET BELOW LAND SURFACE

CECIL\FFS\FS-1_9.dwg\NP\3-25-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

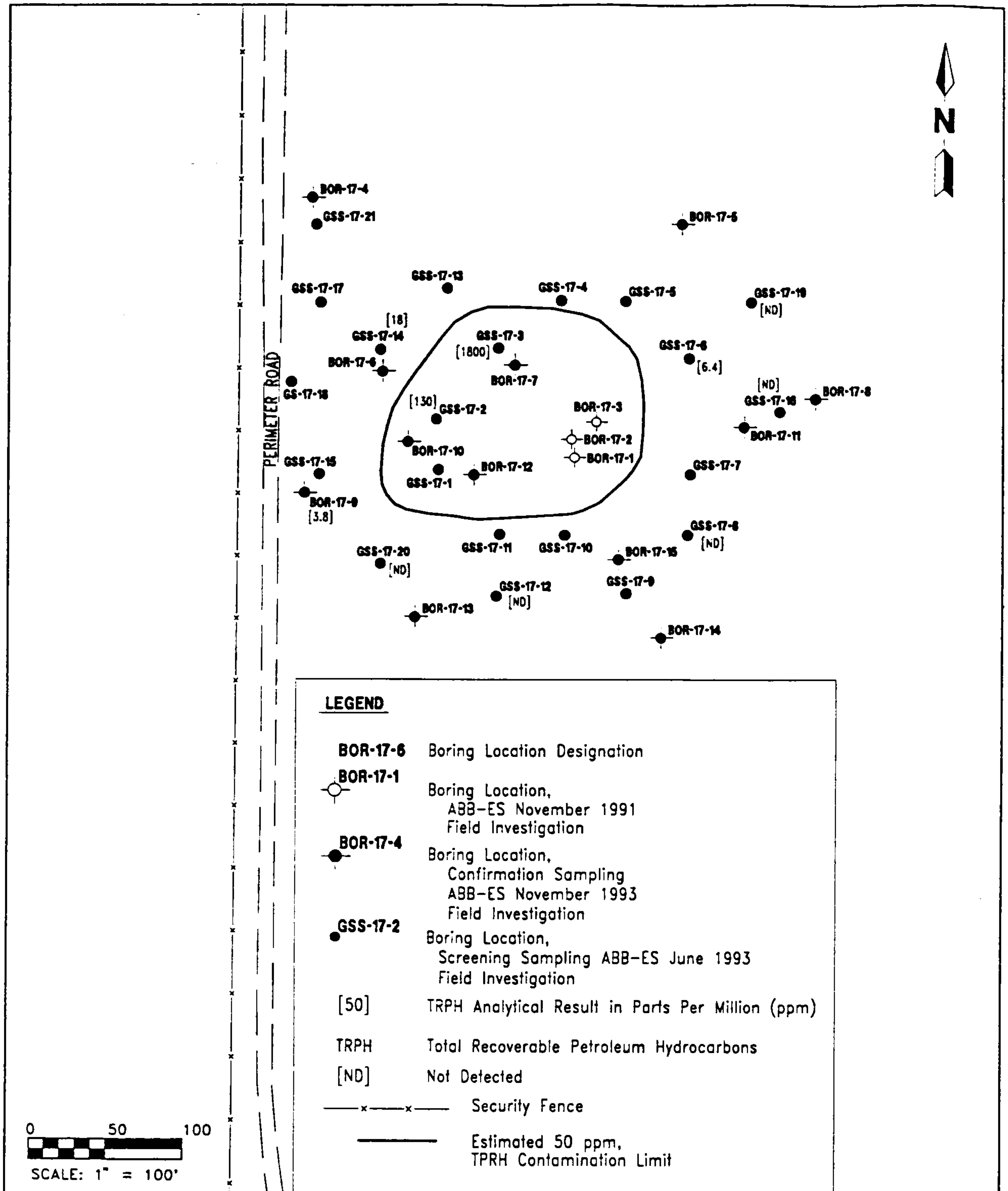


FIGURE 1-10
TRPH RESULTS,
6 TO 8 FEET BELOW LAND SURFACE

CECIL/FFS/FS-1_10.dwg/NP/3-25-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

There is no definitive basis for classifying the soils at Site 17 as a listed hazardous waste. However, the soils could still be found to be characteristically hazardous and this possibility is discussed in greater detail in Section 2.2.

Groundwater Contamination. Groundwater results from the 1991 RI showed contamination with chlorinated solvents only, with TCE being the highest detected compound at 44 $\mu g/\ell$ however, benzene, toluene, ethylbenzene and xylene (BTEX) analysis was not conducted due to the malfunction of the FID detector. Although complete results from groundwater monitoring during the 1993 RI were not available during preparation of this report, the results that are available have not shown a strong presence of chlorinated solvents. Groundwater is primarily contaminated with TRPH, bis(2-ethylhexyl)-phthalate, and phenol. Other compounds have also been detected including toluene, diethylphthalate, di-n-butylphthalate, and 4-methylphenol. TRPH detections occur at each well cluster location to the southeast of the site. Samples from wells to the northwest did not have TRPH contamination. There is no indication of a non-aqueous phase liquid (NAPL) present at Site 17.

2.0 IDENTIFICATION OF REMEDIAL ACTION OBJECTIVES

This chapter presents remedial action objectives for source control at Site 17. The remedial action objectives will provide the basis for selecting appropriate remedial technologies and developing remedial alternatives for the site.

Section 2.1 presents summaries of location-, chemical-, and action-specific ARARs that were considered prior to defining the remedial action objectives. Section 2.2 presents remedial action objectives and discusses considerations for partial source control remedial action at Site 17.

2.1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs). ARARs are Federal and State requirements used to: (1) evaluate the appropriate extent of site cleanup, (2) scope and formulate remedial action alternatives, and (3) control the implementation and operation of a selected remedial action. CERCLA and the NCP require that remedial actions comply with State ARARs that are more stringent than Federal ARARs, legally enforceable, and consistently enforced statewide.

CERCLA, SARA, and the NCP require that ARARs be identified during the development of remedial alternatives. ARARs are used to determine the appropriate extent of site cleanup, identify sensitive land areas or land uses, develop remedial action alternatives, and direct site remediation. ARARs for Site 17 are identified in this section. Potential ARARs in each category (i.e., location-, chemical-, and action-specific) are described in detail in the handbook of ARARs for Navy sites within the State of Florida (ABB-ES, 1993).

2.1.1 Definition of ARARs The NCP defines two ARAR components: (1) applicable requirements and (2) relevant and appropriate requirements.

> Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, or other circumstance found at a CERCLA site. Only those State standards that are: (1) identified by the State in a timely manner, (2) consistently enforced, and (3) more stringent than Federal requirements may be applicable.
>
> Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements under Federal and State environmental and facility siting laws that, although not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Other requirements to be considered are Federal and State non-promulgated advisories or guidance that are not legally binding and do not have the status of potential ARARs. However, if there are not specific ARARs for a chemical or site condition or if ARARs are not deemed sufficiently protective, then guidance or advisory criteria should be identified and used for protection of human health and the environment.

Under the description of ARARs set forth in the NCP and SARA, State and Federal ARARs are categorized as:

- location-specific (i.e., pertaining to existing natural site features and manmade features, such as historical or archaeological sites),
- chemical-specific (i.e., governing the extent of site remediation with regard to specific contaminants and pollutants), and
- action-specific (i.e., pertaining to the proposed site remedies and governing implementation of the selected site remedy).

During the detailed analyses of remedial alternatives, each alternative will be analyzed to determine its compliance with ARARs. Location-, chemical-, and action-specific ARARs are discussed in the following subsections.

2.1.2 Location-Specific ARARs Location-specific ARARs govern natural site features (e.g., wetlands, floodplains, wilderness areas, and endangered species) and manmade features (e.g., places of historical or archeological significance). These ARARs place restrictions on concentrations of hazardous substances or the activities that can be conducted based solely on the site's particular characteristics or location. A wetland is located in the vicinity of Site 17; however, no adverse impact on this wetland is anticipated from this interim action. Interim remedial actions may have to comply with the 40 Code of Federal Regulations (CFR) Part 6, Protection of Wetlands, Executive Order No. 11990, and Chapter 17-611, Florida Administrative Code (FAC), Florida Wetlands Application Regulations, November 1990.

2.1.3 Chemical-Specific ARARs Chemical-specific requirements are usually health- or risk-based standards that limit the concentration of a chemical found in or discharged to the environment. They govern the extent of site remediation by providing either actual cleanup levels or the basis for calculating such levels. Table 2-1 presents the chemical-specific ARARs for Site 17.

2.1.4 Action-Specific ARARs Action-specific ARARs are technology- or activity-based limitations controlling activities for remedial actions. Action-specific ARARs generally set performance or design standards, controls, or restrictions on particular types of activities. To develop technically feasible alternatives, applicable performance or design standards must be considered during the detailed analyses of remedial alternatives.

Certain action-specific ARARs include permit requirements; however, under CERCLA Section 121(e), permits are not required for remedial actions conducted entirely onsite at Superfund sites. This permit exemption applies to all administrative requirements, including approval of or consultation with administrative bodies, documentation, recordkeeping, and enforcement. However, the substantive requirements of these ARARs must be attained.

Table 2-1
Synopsis of Potential Federal Chemical-Specific Applicable or Relevant and Appropriate Requirements (ARARs)

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Federal Standards and Requirements	Requirements Synopsis	Consideration in the Remedial Response Process
Occupational Safety and Health Act (OSHA), Occupational Health and Safety Regulations (29 Code of Federal Regulations [CFR] Part 1910, Subpart Z)	Established permissible exposure limits for work-place exposure to a specific listing of chemicals.	**Applicable.** Standards are applicable for worker exposure to OSHA hazardous chemicals during remedial activities.
Resource Conservation and Recovery Act (RCRA), Identification and Listing of Hazardous Waste (40 CFR Part 261)	Defines those solid wastes subject to regulation as hazardous wastes under 40 CFR Parts 262-265.	**Applicable.** These requirements define RCRA-regulated wastes, thereby delineating acceptable management approaches for listed and characteristically hazardous wastes that should be incorporated into the remedial response.
Safe Drinking Water Act (SDWA), Maximum Contaminant Level Goals (MCLGs) [40 CFR Part 141]	Establishes drinking water quality goals at levels of no known or anticipated adverse health effects with an adequate margin of safety. These criteria do consider treatment feasibility or cost elements.	**Relevant and appropriate.** MCLGs greater than zero are relevant and appropriate standards for groundwaters that are current or potential sources of drinking water. MCLGs may be used in evaluating leaching of contaminants from soil to groundwater.
SDWA, National Primary Drinking Water Standards, Maximum Contaminant Levels (MCLs) [40 CFR Part 141]	Establishes enforceable standards for specific contaminants that have been determined to adversely effect human health. These standards, MCLs, are protective of human health for individual chemicals and are developed using MCLGs, available treatment technologies, and cost data.	**Relevant and appropriate.** MCLs are relevant and appropriate standards where the MCLGs are not determined to be ARARs. MCLs may be used for groundwaters that are current or potential drinking water sources and may be used at Site 17 when evaluating leaching from soils to groundwater.
Chapter 17-520, Florida Administrative Code (FAC) Florida Water Quality Standards, May 1990	Establishes the groundwater classification system for the state and provides qualitative minimum criteria for groundwater based on the classification.	**Relevant and appropriate.** The classification system established in this rule defines potable water sources. Drinking water standards are established for potable water sources in Chapter 17-550 and could be used in evaluating leaching from soils to groundwater.

Table 2-1 (Continued)
Synopsis of Potential Federal Chemical-Specific Applicable or Relevant and Appropriate Requirements (ARARs)

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Federal Standards and Requirements	Requirements Synopsis	Consideration in the Remedial Response Process
Chapter 17-550, FAC, Florida Drinking Water Standards, January 1993	Established to implement the Federal Safe Drinking Water Act by adopting the national primary and secondary drinking water standards and by creating additional rules to fulfill State and Federal requirements.	**Relevant and appropriate.** MCLs are relevant and appropriate at Site 17 when considering leaching of contaminants from soils to groundwater.
Chapter 17-770, FAC, Florida Petroleum Contaminated Site Cleanup Criteria, February 1990	Establishes a cleanup process to be followed at all petroleum contaminated sites. Cleanup levels for G-I and G-II groundwater are provided for both the gasoline and kerosene and mixed product analytical groups.	**Applicable.** This is an applicable requirement at Site 17 because it is a petroleum contaminated site discharging to G-II groundwater. However, due to the focused nature of this Focused Feasibility Study (FFS) only soils and their impact on groundwater will be addressed.
Chapter 17-775, FAC, Florida Soil Thermal Treatment Facilities Regulations, December 1990	Establishes criteria for the thermal treatment of petroleum or product contaminated soils. The rule further outlines procedures for excavating, receiving, handling, and stockpiling contaminated soils prior to thermal treatment in both stationary and mobile facilities.	**Relevant and appropriate.** The soil cleanup values established in this rule for total recoverable petroleum hydrocarbon (TRPH), volatile organic compounds (VOCs), volatile organic halocarbons (VOH), polynuclear aromatic hydrocarbons (PAHs), and metals may be relevant and appropriate requirements for contaminated soils and may be applicable if thermal treatment is used.

Remedial activities potentially associated with Site 17 may include excavation, offsite disposal, thermal treatment, and biological treatment. Table 2-2 summarizes potential action-specific ARARs for the above-mentioned remedial actions. Each alternative will be analyzed in Chapter 4.0 to evaluate compliance with action-specific ARARs.

2.2 DISCUSSION OF REMEDIAL ACTION OBJECTIVES. This section identifies and discusses the remedial action objectives for the interim remedial action at Site 17. As defined in CERCLA guidance, remedial action objectives are media-specific goals established to protect human health and the environment (USEPA, 1988). These objectives are typically based on contaminants of concern (COCs), exposure route(s), and receptor(s) present or available at the site. A baseline risk assessment has not been completed for the site; however, a qualitative evaluation of site risks as described in Chapter 9 of the *Interim Final Guidance on Preparing Superfund Decision Documents* can be used to evaluate a site for an interim action (USEPA 1989). The *Guide to Developing Superfund No Action, Interim Action, and Contingency Remedy RODs* gives the following reasons for taking an interim action (USEPA, 1991):

- to take quick action to protect human health and the environment from an imminent threat in the short term while a final remedial solution is being developed, or

- to institute temporary measures to stabilize the site or operable unit and/or prevent further migration or degradation.

Remedial action objectives were established for this interim action to prevent further contamination of groundwater. Groundwater contamination was briefly described in Section 1.4. Removing the TRPH in the soils will prevent further migration of petroleum contamination from these soils to the groundwater. Protection of human health and the environment was also considered qualitatively during development of remedial action objectives.

Although groundwater contamination at Site 17 will not be addressed directly by this interim action, the remedial action objectives identified for source control are anticipated to be consistent with future groundwater remedies to mitigate releases of hazardous substances from site soils to groundwater. Upon completion of the RI for OU 2, the need for remedial action to address groundwater contamination will be evaluated. This report only addresses potential source control remedial actions.

2.2.1 Remedial Action Objectives As discussed in Section 1.3, waste oils and fuels were disposed at Site 17. As a result, contaminated soils are acting as a source of groundwater contamination. Remediation of contaminated soil in the vadose zone would reduce this source of groundwater contamination and reduce risks associated with direct contact exposure, thus, achieving one step toward protection of human health and the environment. Therefore, the remedial action objectives at Site 17 are to:

- remediate contaminated soils in the vadose zone to reduce the source of contaminants to groundwater, and

Table 2-2
Synopsis of Potential Federal and State Action-Specific ARARs

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Federal and State Standards and Requirements	Requirements Synopsis	Consideration in the Remedial Response Process
Clean Air Act (CAA), National Ambient Air Quality Standards (NAAQS) (40 Code of Federal Regulations [CFR] Part 50)	Establishes primary (health-based) and secondary (welfare-based) standards for air quality for carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, and sulfur oxides.	**Applicable.** Site remedial activities must comply with NAAQS. The most relevant pollutant standard is for particulate matter less than 10 microns in size (PM_{10}) as defined in 40 CFR Section 50.6. The PM_{10} standard is based on the detrimental effects of particulate matter to the lungs of humans. The PM_{10} standard for a 24-hour period is 150 micrograms per cubic meter ($\mu g/m^3$) of air, not to be exceeded more than once a year. Remedial construction activities such as excavation will need to include controls to ensure compliance with the PM_{10} standard. The attainment and maintenance of primary and secondary NAAQS are required to protect human health and welfare (wildlife, climate, recreation, transportation, and economic values). These standards are applicable during remedial activities, such as soil excavation, that may result in exposure to hazardous chemicals through dust and vapors.
CAA, New Source Performance Standards (NSPS) (40 CFR Part 60)	This regulation establishes new source performance standards (NSPS) for specified sources, including incinerators. This rule establishes a particulate emission standard of 0.08 grains per dry standard cubic foot corrected to 12 percent carbon dioxide for sources.	**Relevant and appropriate.** Because NSPS are source-specific requirements, they are not generally considered applicable to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) cleanup actions. However, an NSPS may be applicable for an incinerator; or may be a relevant and appropriate requirement if the pollutant emitted and the technology employed during the cleanup action are sufficiently similar to the pollutant and source category regulated.
Department of Transportation Rules for Transportation of Hazardous Materials (49 CFR Parts 107, 171, 173, 178, and 179)	This regulation establishes the procedures for packaging, labeling, and transporting of hazardous materials.	**Applicable.** These requirements will be applicable for transport of hazardous material from the site for laboratory analysis, treatment, or disposal.
Chapter 17-2, Florida Administrative Code (FAC), Florida Air Pollution Rules, September 1990	Establishes permitting requirements for owners or operators of any source that emits any air pollutant. This chapter also establishes ambient air quality standards for sulfur dioxide, PM_{10}, carbon monoxide, and ozone.	**Applicable.** Standards for PM_{10} would be applicable during remediation. Engineering controls and monitoring to control dust would be required.
Resource Conservation and Recovery Act (RCRA), Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF) (40 CFR Part 264)	This rule establishes minimum national standards that define the acceptable management of hazardous wastes for owners and operators of facilities that treat, store, or dispose of hazardous wastes.	**Applicable.** If a remedial alternative for Site 17 involves the management of RCRA wastes at an offsite treatment, storage, or disposal unit, the substantive requirements of this rule would be applicable.

0004 (d

Table 2-2 (Continued)
Synopsis of Potential Federal and State Action-Specific ARARs

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Federal and State Standards and Requirements	Requirements Synopsis	Consideration in the Remedial Response Process
RCRA, Use and Management of Containers (40 CFR Part 264, Subpart I)	Sets standards for the storage of containers of hazardous waste.	**Relevant and appropriate.** Remedial action implemented at Site 17 may involve the storage of containers that may contain RCRA hazardous waste. The staging of study-generated RCRA wastes should meet the intent of this regulation. These requirements are applicable for containerized RCRA hazardous wastes at CERCLA sites and may be considered relevant and appropriate for wastes not classified as hazardous.
Chapter 17-775, FAC, Florida Soil Thermal Facilities Regulations	This rule establishes criteria for the thermal treatment of petroleum- or petroleum product contaminated soils. Guidelines for management and treatment of soils to levels that prevent future contamination of other soils, groundwater, and surface water are provided. Chapter 17-775.300, FAC, provides permitting requirements for soil thermal treatment facilities. This section states that soil must be screened or otherwise processed in order to prevent soil particles greater than 2 inches in diameter from entering the thermal treatment unit. This rule further outlines procedures for excavating, receiving, handling, and stockpiling contaminated soils prior to thermal treatment in both stationary and mobile facilities.	**Applicable.** This requirement is applicable to treatment alternatives that employ thermal treatment technologies. It may be relevant and appropriate for other treatment alternatives.
RCRA, Manifest System, Recordkeeping, and Reporting (40 CFR Part 264, Subpart E)	This rule outlines procedures for manifesting hazardous waste for owners and operators of onsite and offsite facilities that treat, store, or dispose of hazardous waste.	**Applicable.** These regulations apply if a remedial alternative involves the offsite treatment, storage, or disposal of hazardous waste. For remedial actions involving onsite treatment or disposal of hazardous waste, these regulations are relevant and appropriate
Hazardous Materials Transportation Act (49 CFR Parts 171, 173, 178, and 179) and Hazardous Materials Transportation Regulations	These regulations establish procedures for the packaging, labeling, manifesting, and transporting of hazardous materials.	**Applicable.** For remedial actions involving offsite treatment, storage, or disposal, contaminated hazardous materials would need to be packaged, manifested, and transported to a licensed offsite facility in compliance with these regulations.
RCRA, Standards Applicable to Transporters of Hazardous Waste (40 CFR Part 263, Subparts A - C, 263.10-263.31)	This rule establishes procedures for transporters of hazardous waste within the United States if the transportation requires a manifest under 40 CFR Part 262.	**Applicable.** If a remedial alternative involves offsite transportation of hazardous waste for treatment, storage, or disposal, these requirements must be attained.

000458

Table 2-2 (Continued)
Synopsis of Potential Federal and State Action-Specific ARARs

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Federal and State Standards and Requirements	Requirements Synopsis	Consideration in the Remedial Response Process
RCRA, Standards Applicable to Generators of Hazardous Waste (40 CFR Part 262, Subparts A - D, 262.10-262.44)	These rules establish standards for generators of hazardous wastes that address: accumulating waste, preparing hazardous waste for shipment, and preparing the uniform hazardous waste manifest. These requirements are integrated with U.S. Department of Transportation (DOT) regulations.	**Applicable.** If an alternative involves the offsite transportation of hazardous wastes, the material must be shipped in proper containers that are accurately marked and labeled, and the transporter must display proper placards. These rules specify that all hazardous waste shipments must be accompanied by an appropriate manifest.
RCRA, Identification and Listing of Hazardous Waste (40 CFR Part 261, 261.1-261.33)	This rule defines those solid wastes that are subject to regulation as hazardous wastes under 40 CFR Parts 262-265. The applicability of RCRA regulations to wastes found at a site is dependent on the solid waste meeting one of the following criteria: (1) the wastes are generated through a RCRA listed source process, (2) the wastes are RCRA-listed wastes from a non-specific source, or (3) the waste is characteristically hazardous due to ignitability, corrositivity, reactivity, or toxicity.	**Applicable.** Contaminated soils could be classified as a RCRA hazardous waste. Historical records do not suggest soils would be a listed waste and soil contamination does not indicate soils would be characteristically hazardous; however, specific testing would have to be conducted to evaluate this possibility. Residuals from treatment methods may also be classified as RCRA hazardous wastes and would have to be tested for RCRA hazardous characteristics.
RCRA, Land Disposal Restrictions for Newly Listed Wastes and Hazardous Debris (40 CFR Parts 148, 260, 261, 262, 264, 265, 270, and 271)	This rule sets forth five options for management of hazardous debris: (1) treat the debris to performance standards established in this rule through one of 17 approved technologies, (2) obtain a ruling from USEPA that the debris no longer contains hazardous waste, (3) treat the debris using a technology approved through an "equivalent technology demonstration," (4) treat the debris to existing Land Disposal Restriction (LDR) standards for wastes contaminating the debris and continue to manage under RCRA Subtitle C, or (5) dispose of debris in a Subtitle C landfill under the generic extension of the capacity variance for hazardous debris, which currently expires on May 8, 1994.	**Applicable.** Debris at Site 17 is not anticipated; however, if encountered, it would be classified as hazardous debris if it is contaminated with RCRA listed waste that has LDR standards or with waste that exhibits a hazardous characteristic. Under CERCLA, removal of contaminants from debris by decontamination and replacing the debris within an area of concern (AOC) is permitted. As long as movement of waste is conducted within the AOC and outside of a separate RCRA unit, placement of wastes has not occurred and, therefore, LDRs are not triggered. However, if the debris is determined to be hazardous, and placement is determined to occur, one of the five listed options must be selected for management of the hazardous debris.
RCRA, Corrective Action Management Units; Corrective Action Provisions Under Subtitle C (40 CFR Parts 260, 264, 265, 268, 270, and 271)	This rule establishes corrective action management units (CAMU) and temporary units (TUs) as two options for corrective actions at permitted RCRA facilities.	**Applicable.** The substantive requirements of this rule is a potential ARAR at Site 17 because hazardous wastes may be stored onsite for any remedial alternative implemented.
RCRA, Land Disposal Regulations (LDRs) (40 CFR Part 268)	This rule establishes restrictions for the land disposal of untreated hazardous wastes and provides treatment standards for these land-banned wastes. Under this rule, treatment standards have been established for most listed hazardous wastes.	**Applicable.** Treatment standards for wastes removed at Site 17 would be established upon completion of testing of materials. If it is determined that wastes removed from Site 17 are subject to these regulations, then the wastes must be treated prior to disposal in a RCRA Subtitle C landfill.

00458

Table 2-2 (Continued)
Synopsis of Potential Federal and State Action-Specific ARARs

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Federal and State Standards and Requirements	Requirements Synopsis	Consideration in the Remedial Response Process
RCRA, Contingency Plan and Emergency Procedures (40 CFR Subpart D, 264.30-264.37)	This regulation outlines the requirements for procedures to be followed in the event of an emergency such as an explosion, fire, or other emergency event.	**Relevant and appropriate.** These requirements are relevant and appropriate for remedial actions involving the management of hazardous waste.
Occupational Safety and Health Act (OSHA), General Industry Standards (29 CFR Part 1910)	This act requires establishment of programs to assure worker health and safety at hazardous waste sites, including employee training requirements.	**Applicable.** Under 40 CFR 300.38, requirements apply to all response activities under the National Contingency Plan (NCP). During remedial action at the site, these regulations must be maintained.
OSHA, Recordkeeping, Reporting, and Related Regulations (29 CFR Part 1904)	Provides recordkeeping and reporting requirements applicable to remedial activities.	**Applicable.** These requirements apply to all site contractors and subcontractors and must be followed during all site work. During remedial action at the site, these regulations must be maintained.
OSHA, Health and Safety Standards (29 CFR Part 1926)	Specifies the type of safety training, equipment, and procedures to be used during site investigation and remediation.	**Applicable.** All phases of the remedial response project should be executed in compliance with this regulation. During remedial action at the site, these regulations must be maintained.
RCRA, General Facility Standards (40 CFR Subpart B, 264.10-264.18)	Sets the general facility requirements including general waste analysis, security measures, inspections, and training requirements.	**Applicable.** Because the remedial action planned for Site 17 may involve the management of RCRA wastes at an offsite TSDF, these requirements are applicable.
RCRA, Preparedness and Prevention (40 CFR Part 264, Subpart C)	This regulation outlines requirements for safety equipment and spill-control for hazardous waste facilities. Facilities must be designed, maintained, constructed, and operated to minimize the possibility of an unplanned release that could threaten human health or the environment.	**Applicable.** Safety and communication equipment should be incorporated into all aspects of the remedial process and local authorities should be familiarized with site operations.
Chapter 17-4, FAC, Florida Rules on Permits, May 1991	Establishes procedures for obtaining permits for sources of pollution.	**Relevant and appropriate.** The substantive permitting requirements of this rule must be met during the remedial action at Site 17.
Chapter 17-736, FAC, Florida Rules on Hazardous Waste Warning Signs, July 1991	Requires warning signs at National Priority List (NPL) and Florida Department of Environmental Regulation (FDEP; formerly Florida Department of Environmental Regulation [FDER]) identified hazardous waste sites to inform the public of the presence of potentially harmful conditions.	**Applicable.** Because Naval Air Station (NAS) Cecil Field is currently listed on the NPL, this requirement is applicable.
RCRA, Solid Waste Land Disposal Requirements (40 CFR Part 258)	This rule sets forth requirements for disposal of waste within a solid waste landfill. Also sets forth construction and monitoring requirements of Subtitle D landfills.	**Applicable.** This rule stipulates that no free liquids, no hazardous wastes, and no reactive wastes may be deposited within a Subtitle D landfill. These requirements are applicable if soils and wastes are disposed at a Subtitle D landfill.

- remediate contaminated surface soils to reduce health risks from direct contact exposure.

The response objectives do not address soil below the groundwater table. The response objectives intend to reduce direct-contact risks; however, a risk assessment has not been completed for the site as part of this FFS. Final remediation of Site 17 including an evaluation of acceptable risk will be addressed in an FS for OU 2 at a later time. It is believed that these FFS response objectives will be consistent with the final response objectives for the site.

<u>2.2.2 Soil Action Levels</u> This subsection summarizes the establishment of soil action levels for the interim remediation of Site 17. Several approaches were considered for development of soil action levels to meet the response objectives.

One set of criteria considered was to remediate soils based on direct contact exposure risk. A complete risk assessment for this site is not scheduled to be completed until the end of 1994. To provide a preliminary indication of potential risk due to direct contact with soils, analytical results for soils at Site 17 were compared with concentrations listed in the risk-based concentration tables distributed by USEPA Region III (USEPA RIII, 1994). This comparison is presented in Appendix C. No site soils were found to exceed the risk-based concentrations with the exception of lead. Lead levels were found to exceed the USEPA Region III risk-based concentration for tetraethyl lead; however, it is not known how much of the lead detected at Site 17 is in the form of tetraethyl lead or if any tetraethyl lead was deposited at the site. Lead is a naturally occurring constituent of soil and the concentrations observed, with the exception of one sample, are typical of background lead concentrations for NAS Cecil Field (see Section 1.4).

Another approach to establishing soil action levels that was considered was based on leaching of contaminants from soils to groundwater. Instead of partitioning and fate and transport modeling, a relationship taken from the TCLP described in Appendix II of Part 261 of the Federal Register was used. The TCLP is designed to determine the mobility of both organic and inorganic contaminants present in liquid, solid, or multi-phased wastes. The TCLP is a conservative measure of potential leaching of contaminants because it uses an aggressive extraction liquid (acetic acid) and agitates the sample. Actual leaching of contaminants at Site 17 by groundwater is likely to be less than that predicted using the TCLP relationship. For solids, the procedure consists of using a strong solvent to extract as much of the contaminants as possible from the sample under standard test conditions. Because the TCLP uses an amount of extraction fluid equal to 20 times the weight of the solid phase, the following equation can be used to described the transfer of the contaminant from the solid phase to the liquid extract if the contaminant is entirely leached:

$$\frac{X \textit{ milligrams (mg) of contaminant}}{\textit{kilograms (kg) of soil}} = 20\ Y \textit{ mg of contaminants per liter } (\ell) \textit{ of extract} \quad (1)$$

If a regulatory threshold for water is substituted for Y in the above equation, then, by the TCLP definition, X will describe the total analytical concentration in soil below which the regulatory threshold in water will not be exceeded based on leaching.

Toxicity characteristic regulatory levels, Florida maximum contaminant levels (MCLs), and tap water concentrations from USEPA Region III risk-based concentration tables were used as the regulatory threshold in water. These thresholds were multiplied by 20 and the lowest of the three was compared with analytical soil results for Site 17. Appendix C shows the results of these comparisons. Table 2-3 summarizes the organic compounds detected that exceed one or more of the potential soil action levels developed.

Exceedances were observed for some chlorinated organics, some polynuclear aromatic hydrocarbons (PAHs), TRPH, and several inorganics. Inorganic concentrations are mostly typical of background concentrations for soils at NAS Cecil Field as discussed in Section 1.4 and, therefore, should not be used to control remediation. A limited number of samples were analyzed for chlorinated organics and PAHs at low detection levels. Limits of remediation based on these would be inaccurate for meeting the response objectives. TRPH data for the site are more extensive and provides the best opportunity for delineating limits of remediation. The TRPH level determined by multiplying the Florida MCL by 20 is 100 mg/kg.

The 100 mg/kg TRPH level was further modified by considering the Florida Department of Environmental Protection (FDEP) regulations for thermal treatment of petroleum contaminated soil (Chapter 17-775, FAC, *Soil Thermal Treatment Facilities*, December 1990). These regulations require soils to be treated to the following criteria.

- Total volatile organic aromatics (VOAs) less than 100 micrograms per kilogram (μg/kg) and TRPH less than 10 mg/kg; or TRPH less than 50 mg/kg, PAHs less than 1 mg/kg, and VOHs less than 50 μg/kg.

- Metal concentrations less than the following:

	TCLP (milligrams per liter [mg/ℓ])	Total (mg/kg)
Arsenic	5.0	10
Barium	100.0	4,940
Cadmium	1.0	37
Chromium	5.0	50
Lead	5.0	108
Mercury	0.2	23
Selenium	1.0	389
Silver	5.0	353

The 50 ppm TRPH level was chosen and TRPH data for the site were plotted with depth. Conformance with the VOAs, PAHs, VOHs, and metals cleanup levels are not expected to be a problem based on existing analytical data. Limits of excavation for 50 ppm TRPH were then estimated as shown on Figures 2-1 through 2-5. A check was then performed on the exceedances of contaminants other than TRPH to determine to what extent they are encompassed by the proposed remedial limits based on TRPH. Table 2-4 presents a summary of exceedances based on the 20 times relationship that would not be addressed by the 50 parts per million (ppm) TRPH remediation limits as shown in Figures 2-1 through 2-5.

Table 2-3
Summary of Exceedances of Potential Soil Action Levels

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Location	Depth (feet)	Compound[1]	Concentration (mg/kg)	Lowest Potential Action Level (mg/kg)
1991 RI Boring Samples				
BOR-17-1	0 to 1	Methylene chloride	29	0.082
		TRPH	12,000	100
BOR-17-1D	0 to 1	Methylene chloride	2.4	0.082
		TRPH	11,700	100
BOR-17-1	1 to 2	Naphthalene	9.1	2
		2-Methylnaphthalene	16	2
		bis(2-Ethylhexyl)phthalate	6	0.08
		TRPH	25,000	100
BOR-17-2	0 to 1	Methylene chloride	0.17	0.082
		bis(2-Ethylhexyl)phthalate	0.84	0.08
		TRPH	6,140	100
BOR-17-2	1 to 2	Methylene chloride	58	0.082
		Trichloroethene	0.79	0.032
		Naphthalene	6.2	2
		TRPH	22,800	100
BOR-17-3	0 to 1	TRPH	532	100
BOR-17-3	1 to 2	Methylene chloride	0.083	0.082
1993 RI Screening Surface Soil Samples				
AGSS-17-6	0 to 2	TRPH	500	100
AGSS-17-23	0 to 2	TRPH	630	100
AGSS-17-44	0 to 2	TRPH	680	100
AGSS-17-45	0 to 2	TRPH	11,000	100
AGSS-17-61	0 to 2	1,1-Dichloroethylene	0.0065	0.00088
AGSS-17-62	0 to 2	1,1-Dichloroethylene	0.001	0.00088
1993 RI Screening Soil Boring Samples				
GSS-17-1	0 to 2	TRPH	1,700	100
GSS-17-2	4 to 6	TRPH	7,600	100
GSS-17-2D	4 to 6	TRPH	1,700	100
GSS-17-2	6 to 8	TRPH	130	100
GSS-17-3	4 to 6	TRPH	6,800	100
GSS-17-3	6 to 8	TRPH	1,900	100

See notes at end of table.

Table 2-3 (Continued)
Summary of Exceedances of Potential Soil Action Levels

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Location	Depth (feet)	Compound[1]	Concentration (mg/kg)	Lowest Potential Action Level (mg/kg)
1993 RI Confirmation Soil Boring Samples				
BOR-17-4	0 to 2	TRPH	680	100
BOR-17-4	2 to 4	TRPH	110	100
BOR-17-6	0 to 2	bis(2-Ethylhexyl)phthalate	0.11	0.08
		TRPH	810	100
BOR-17-6	2 to 4	bis(2-Ethylhexyl)phthalate	0.12	0.08
		TRPH	330	100
BOR-17-7	0 to 2	2-Methylnaphthalene	3	2
		bis(2-Ethylhexyl)phthalate	0.12	0.08
		4,4-DDE	0.055	0.004
		TRPH	480	100
BOR-17-7	2 to 4	TRPH	5,900	100
BOR-17-8	0 to 2	bis(2-Ethylhexyl)phthalate	0.096	0.08
BOR-17-9	0 to 2	bis(2-Ethylhexyl)phthalate	0.083	0.08
BOR-17-10	0 to 2	TRPH	540	100
BOR-17-10	2 to 4	1,4-Dichlorobenzene	0.73	0.0088
		1,2-Dichlorobenzene	18	7.4
		Naphthalene	0.1	2
		2-Methylnaphthalene	47	2
		TRPH	9,200	100
BOR-17-11	2 to 4	bis(2-Ethylhexyl)phthalate	0.13	0.08
BOR-17-12	0 to 2	Hexachlorobenzene	0.1	0.000132
		bis(2-Ethylhexyl)phthalate	0.16	0.08
		Benzo(b)fluoranthene	0.037	0.00184
		TRPH	1,500	100
BOR-17-12	2 to 4	Methylene chloride	0.35	0.082
		TRPH	910	100
BOR-17-14	2 to 4	bis(2-Ethylhexyl)phthalate	0.089	0.08
BOR-17-15D	0 to 2	1,4-Dichlorobenzene	0.02	0.0088
		bis(2-Ethylhexyl)phthalate	0.089	0.08
BOR-17-15	2 to 4	bis(2-Ethylhexyl)phthalate	0.15	0.08
BOR-17-15D	2 to 4	bis(2-Ethylhexyl)phthalate	0.27	0.08

[1] Summary of organic compounds only.

Notes: Potential soil action level used risk numbers for tetraethyl lead. Analysis performed was total lead.
mg/kg = milligrams per kilogram.
RI = Remedial Investigation.
TRPH = total recoverable petroleum hydrocarbons.
D = duplicate.
4,4-DDE = 4,4-dichlorodiphenyldichloroethene.

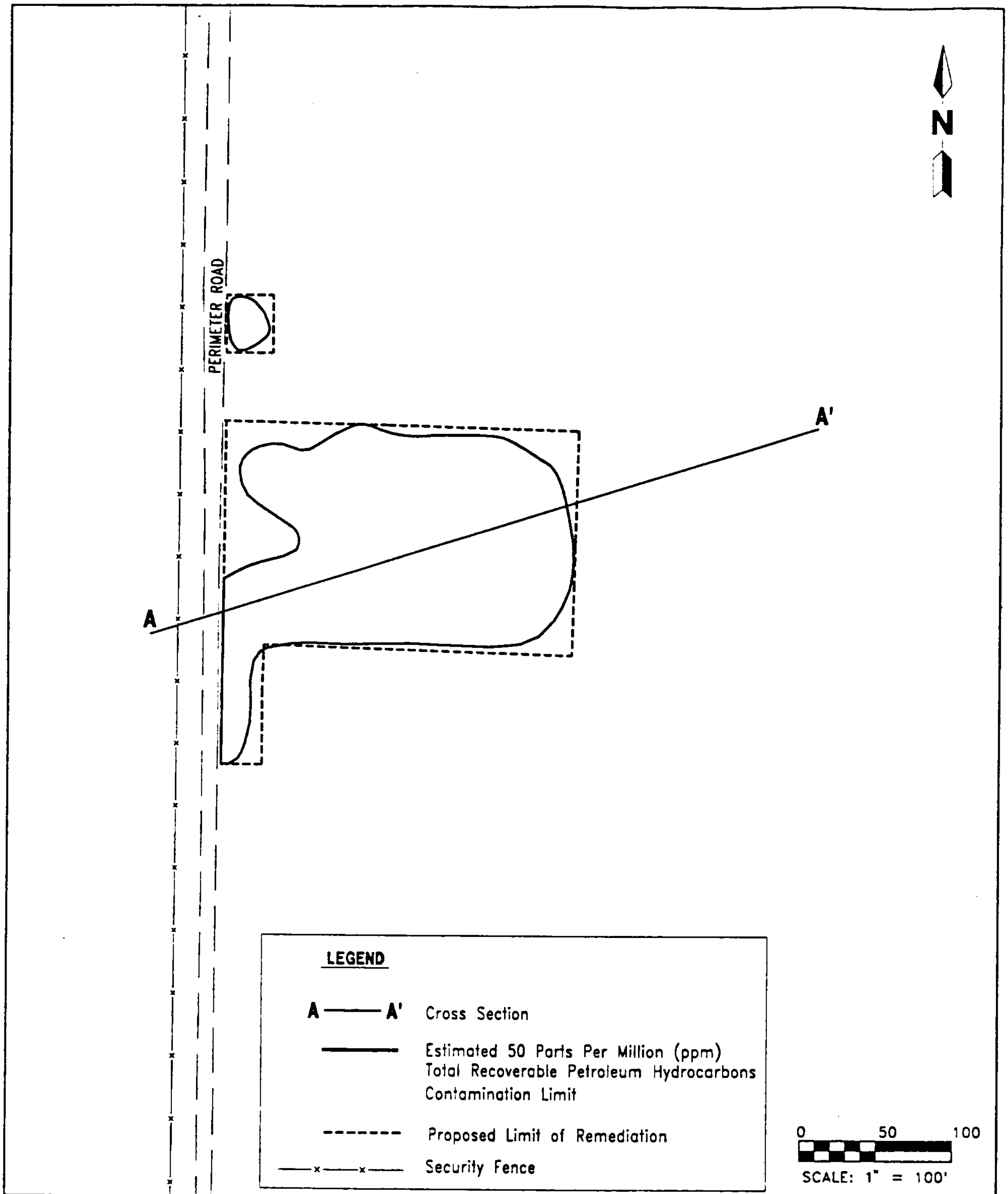


FIGURE 2-1
REMEDIAL LIMITS,
0 TO 2 FEET BELOW LAND SURFACE

CECIL/FFS/FS-2_1.cwg/NP/3-25-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

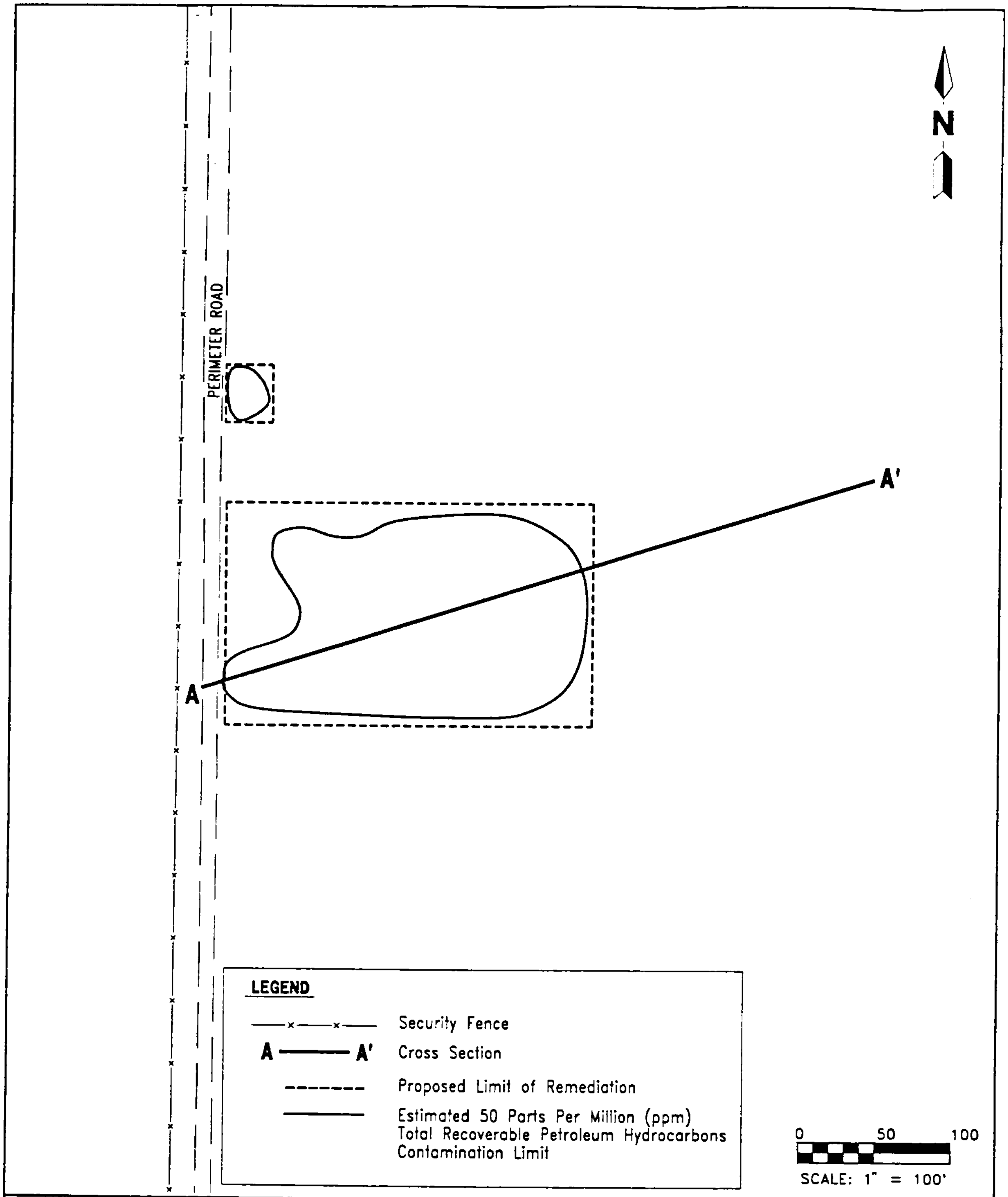


FIGURE 2-2
REMEDIAL LIMITS,
2 TO 4 FEET BELOW LAND SURFACE

CECIL/FFS/FS-2_2.dwg/NP/3-25-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

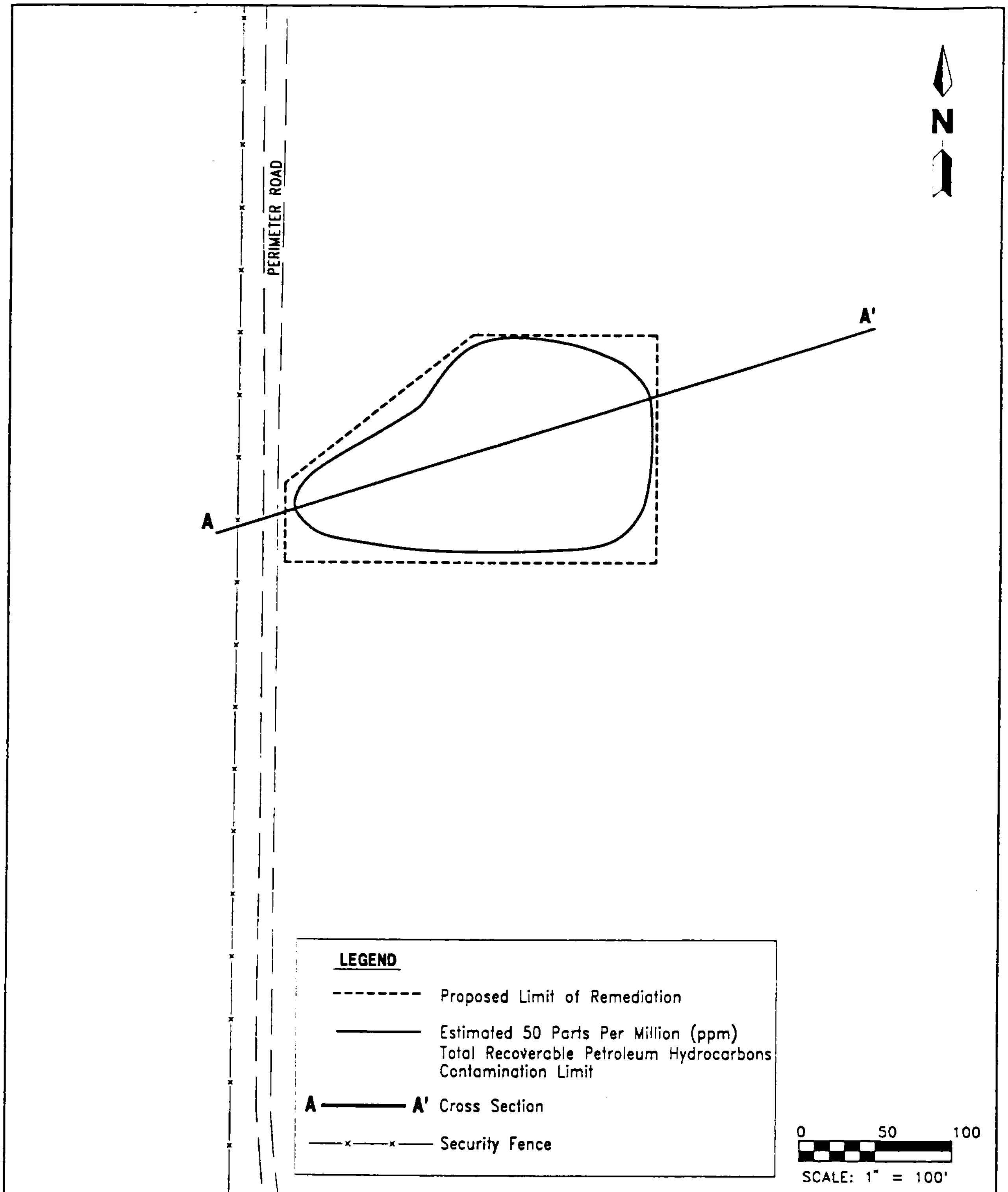


FIGURE 2-3
REMEDIAL LIMITS,
4 TO 6 FEET BELOW LAND SURFACE

CECIL\FFS\FS-2_3.cwg\NP\3-25-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

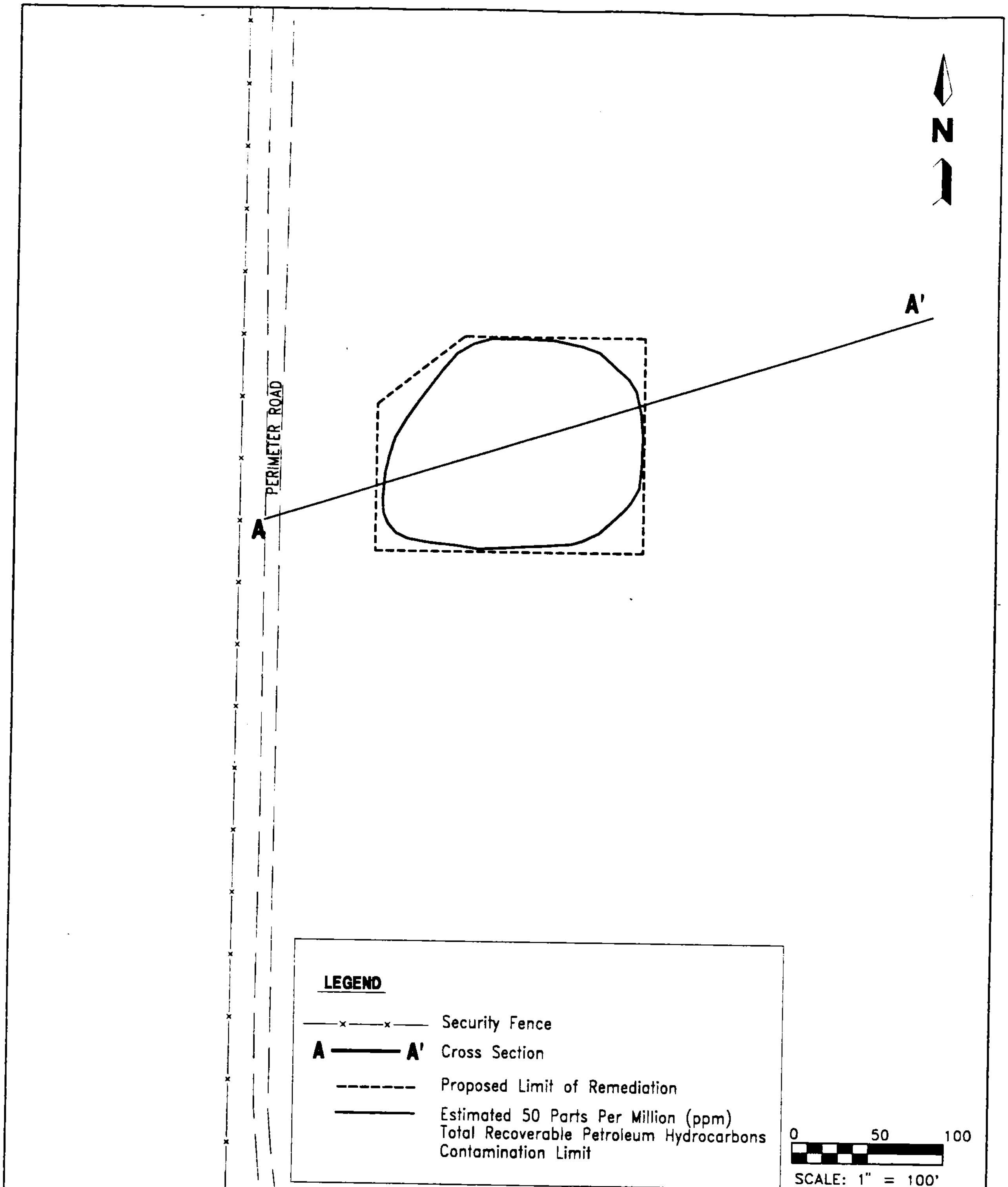
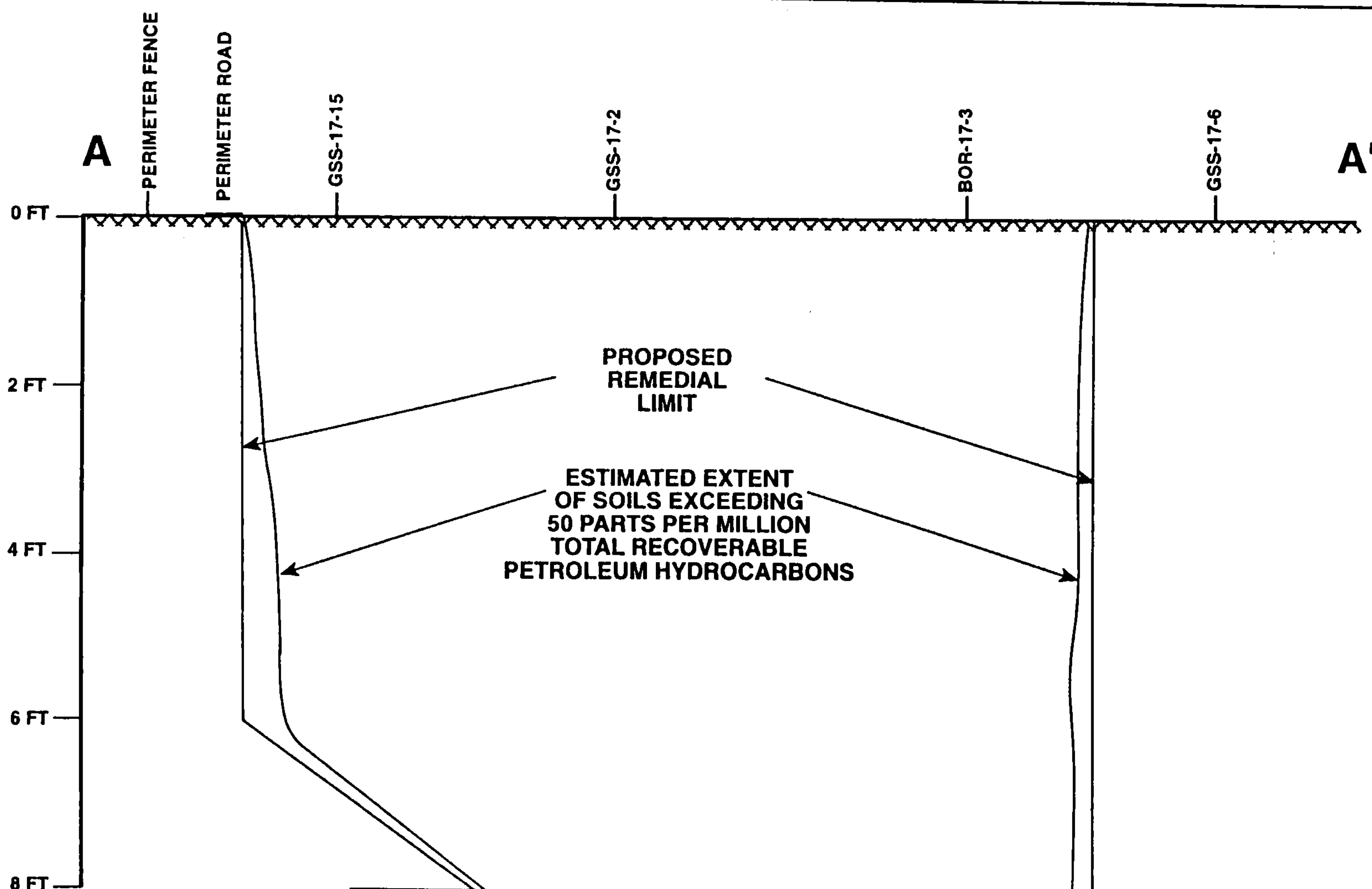


FIGURE 2-4
REMEDIATION LIMITS,
6 TO 8 FEET BELOW LAND SURFACE

CECIL/FFS/FS-2_4.dwg/NP/3-22-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA



HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 2'

FIGURE 2-5

CROSS-SECTION OF REMEDIAL LIMITS

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

8520-26 940323WEM

Table 2-4
Summary of Organic Exceedances Outside Remedial Limits

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Location	Compound	Concentration (mg/kg)
AGSS-17-61	1,1-Dichloroethylene	0.0065
AGSS-17-62	1,1-Dichloroethylene	0.011
BOR-17-8	bis(2-Ethylhexyl)phthalate	0.096
BOR-17-11	bis(2-Ethylhexyl)phthalate	0.13
BOR-17-14	bis(2-Ethylhexyl)phthalate	0.088
BOR-17-15	bis(2-Ethylhexyl)phthalate	0.27
BOR-17-15	1,4-Dichlorobenzene	0.02

Note: mg/kg = milligrams per kilogram.

The soil action level for the interim remedial action was selected to be the 50 ppm TRPH level discussed above and the limits of remediation were established based on historical sampling for TRPH. Remediation will proceed to the 50 ppm TRPH remedial limits established. Samples will be collected at the limits of remediation to document what remains, but the remedial limits set for this interim remedial action would not be extended based on these samples. Additional contamination would be addressed as part of the final remediation for the site.

The response objectives for this interim remedial action address only soils in the vadose zone. Because of the historical fluctuation in the groundwater table from 2 feet to 6 feet bls and to maximize the amount of contamination that would be addressed by the interim action, the remediation will have to be scheduled to occur in the proper season to ensure remediation of the maximum amount of vadose zone contamination. Historical data suggest that groundwater has been the lowest in August and September and highest from November to April (see Figures 1-5 and 1-6); however, no measurements have been taken in May, June, or July. The existing historical data suggest that the groundwater can be expected to drop to at least 6 feet bls; however, to address the possibility that a lower groundwater table occurs during remediation, cost estimates are provided in later sections for excavation to 8 feet bls. Based on the above soil action levels, limits of remediation were established, volumes were estimated, and mass of TRPH contamination was estimated. These calculations are shown in Appendix D. An estimated 9,870 cubic yards (yd^3) of contaminated soil with 5,785 kg of TRPH contamination exists down to 8 feet bls.

Based on applying the 20 times equation derived from the TCLP procedure to existing samples, soils would not be expected to exhibit the characteristic of a hazardous waste. If the highest detected concentration of contaminants at Site 17 that are on the toxicity characteristic regulatory list are assumed to completely leach from soils during a TCLP test, then the resulting concentration in the extract would be below the regulatory level specified for those compounds (see Appendix C). The soils are highly unlikely to be either corrosive or reactive. Soil would be considered ignitable if it met the following definition (40 CFR 261.21): "...is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture, or spontaneous chemical changes and when ignited, burns so vigorously and persistently that it creates a hazard." It is unlikely that soils from Site 17 would exhibit such a characteristic and the *Guidance for Assessment and Remediation of Petroleum Contaminated Soil* states that "petroleum contaminated soil may be assumed to not meet this subjective definition." (FDEP, 1992). Based on these considerations, it can be demonstrated that contaminated soils at Site 17 would not be considered a hazardous waste.

3.0 IDENTIFICATION OF SOURCE CONTROL REMEDIAL ALTERNATIVES FOR SITE 17

The development of remedial alternatives for CERCLA sites consists of identifying applicable technologies and developing those technologies into alternatives. SARA emphasizes the use of treatment technologies that reduce toxicity, mobility, or volume of contaminants as a principal element rather than alternatives that prevent exposure. The NCP requires a range of alternatives be presented to the maximum extent practicable. This range includes alternatives from the following categories:

- no action,
- containment, and
- treatment.

A no-action alternative is not appropriate for the focused nature of this FFS. Containment, or the construction of a cover on the surface of the ground that would limit infiltration, would not meet the remedial action objectives established in Section 2.2. Therefore, treatment alternatives were established that range from those that eliminate the need for long-term management to those that reduce toxicity, mobility, or volume of contaminants. The purpose of this section is to identify and screen appropriate remedial technologies (Section 3.1) for assembly into remedial alternatives to address contamination at Site 17 (Section 3.2).

3.1 IDENTIFICATION AND SCREENING OF REMEDIAL TECHNOLOGIES. Remedial technologies were identified based on a review of current literature, vendor information, and experience in developing remedial alternatives for similar sites with similar waste disposals. Technologies were also identified based on site- and waste-specific characteristics. Site characteristics considered during technology development included the following:

- site geology, hydrogeology, and terrain;
- availability of space and resources necessary to implement a given technology; and
- presence of special site features (e.g., recreational land use, sensitive ecological environments, or endangered species).

The following waste characteristics were also considered:

- contaminated media,
- types and concentrations of waste constituents (to the extent known), and
- physical and chemical properties of the waste to the extent known (e.g., mobility).

The NCP and the USEPA's RI/FS guidance for CERCLA sites provide guidance for identifying technologies during an FFS. Table 3-1 presents the technologies applicable for remediation of petroleum contaminated soils and other contaminated

Table 3-1
Identification and Screening of Remedial Technologies

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Technology	Description of Technology	Advantages	Disadvantages	Screening Status
Containment				
Soil cover	A layer of uncontaminated native soil is placed over the disposal area at Site 17 to reduce direct contact and ingestion hazards that may be associated with contaminated soil.	• Soil cover may reduce mobility of contaminants at Site 17. • Exposure to site contaminants via direct contact is minimized. • Technology would be implementable at the site because of the small size and flat terrain of the site. • No secondary waste streams would be generated during implementation of this technology. • Total cost would be low.	• Soil cover would not reduce toxicity or volume of contaminants at Site 17. • Infiltration of precipitation would still occur, thus continuing leaching of contaminants into the surrounding environment. • The fluctuating water table would still promote mobilization of contaminants.	Eliminated. Remedial action objectives would not be met.
Excavation and Treatment				
Onsite incineration of soil	Soil would be excavated and treated in a mobile incinerator unit. Incineration would destroy organic contaminants. An ash byproduct would be produced and managed onsite or offsite.	• Excavation and incineration of wastes would reduce toxicity, mobility, and volume of contaminants at Site 17. • Contaminated media would be treated before leaving the site. • Incineration has been demonstrated as an effective technology for treatment of petroleum and chlorinated organic contaminants.	• Incineration would produce an ash byproduct that may be hazardous and require further management. • Availability of mobile incinerator units is limited. • All substantive Resource Conservation and Recovery Act (RCRA) permitting requirements for air and particulate discharge would need to be met for the onsite incinerator. • Capital and operation and maintenance (O&M) costs may be high; onsite unit would not be cost effective because a relatively small volume of media requires treatment.	Eliminated. Cost of onsite treatment is excessive and availability of equipment is limited.

Table 3-1 (Continued)
Identification and Screening of Remedial Technologies

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Technology	Description of Technology	Advantages	Disadvantages	Screening Status
Offsite incineration of soil	Soil would be excavated and transported to an offsite incinerator that thermally destroys organic contaminants in a direct-fired treatment unit. An ash byproduct would be produced that would require disposal.	• Excavation and incineration of wastes would reduce toxicity, mobility, and volume of contaminants at Site 17. • Availability of offsite incinerators is generally good, especially for limited volumes of waste. • Incineration has been demonstrated as an effective technology for treatment of petroleum and chlorinated organic - contaminants.	• Incineration would produce an ash byproduct that would require disposal. • Transportation and incineration costs are high relative to other treatment technologies. • Requires transportation to offsite facility.	Eliminated. Although effective, incineration is more expensive and offers very little advantage over low temperature thermal treatment for the constituents of concern.
Onsite thermal treatment of contaminated soils	Soil is excavated and treated in a mobile thermal treatment unit that volatilizes organic contaminants and destroys them in a secondary combustion chamber or condenses them into a liquid stream. Soil is tested and returned to the excavation.	• High volatile organic compound (VOC) destruction efficiencies have been achieved at full scale. • Mobile units are available. • Contaminated soils would not have to be transported offsite for treatment.	• Operation and maintenance costs are high. • All substantive permitting requirements would need to be met. • Treatment byproducts (ash from secondary combustion) may require disposal in a RCRA Subtitle C Landfill.	Retained. Demonstrated technology for treatment of petroleum contaminants.
Offsite thermal treatment of contaminated soils	Soil is excavated and transported to an offsite permitted thermal treatment unit that volatilizes organics from the soil and destroys them in a secondary combustion chamber or condenses them into a liquid stream.	• High VOC destruction efficiencies have been achieved. • Offsite units are available.	• Contaminated soils would have to be transported off-site for treatment. • Treatment byproducts (ash from secondary combustion) may require disposal in a RCRA Subtitle C Landfill. • Treatment costs are high.	Retained. Effective treatment that may be cost effective for small volumes.

Table 3-1 (Continued)
Identification and Screening of Remedial Technologies

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Technology	Description of Technology	Advantages	Disadvantages	Screening Status
In-situ Soil Vapor Extraction (SVE)	A vacuum is applied to wells installed in the contaminated zone. Contaminants volatilize, migrate through the soil and are removed by the well. Extracted vapor is treated prior to discharge to the atmosphere.	• Excavation of soils is not required • Effective on volatile contaminants.	• Limited effectiveness on contaminants with low volatility. • Subsurface heterogeneities can cause short-circuiting of soil vapor pathways reducing the radius of influence. • Depending on the off-gas treatment method, contaminants may not be destroyed. • Effective in vadose zone only.	Eliminated. Fluctuating groundwater table would limit effectiveness.
In-situ Biological Venting	Air and nutrients are added to the subsurface to promote the biological degradation of organic contaminants by indigenous microorganisms.	• Excavation is not required. • Organic contaminants are destroyed.	• Maintaining optimum conditions for microorganisms may be difficult. • Biological processes may only achieve partial treatment.	Retained. Biological treatment of petroleum contaminated soils is demonstrated.
In-situ Land Farming	Contaminated soils are remediated biologically in place by addition of water and nutrients and cultivation with farm equipment.	• Contaminants are destroyed. • Equipment is readily available and the technology is easily implemented. • Soils are treated in place.	• Remediation beyond a 2-foot depth would require excavation.	Retained. Potentially effective for treatment of surface soils.
Onsite ex-situ biological treatment	Contaminated soils are excavated and remediated biologically by the addition of nutrients, water, and air in soil piles, land farming, or other techniques.	• Effectively degrades petroleum contaminants. • Control of biological treatment is easier ex-situ. • Equipment is readily available and easily implemented.	• Excavation is required. • Leachate collection and treatment may be required.	Retained. Effective treatment that is easy to implement and control.

Table 3-1 (Continued)
Identification and Screening of Remedial Technologies

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Technology	Description of Technology	Advantages	Disadvantages	Screening Status
Offsite disposal (Subtitle D)	Wastes are transported to an offsite solid waste landfill facility for disposal.	• Mobility of contaminants is reduced at an engineered landfill. • Disposal is a widely used and easily implementable technology. • Relatively small mobilization effort is necessary compared to onsite treatment. • Experienced transportation and disposal vendors are available.	• Long-term liability associated with disposal of wastes. • Public acceptance of disposal at community landfill is in question.	Retained. Soil may be disposed in a Subtitle D landfill. May be applicable for disposal of nonhazardous waste associated with remedial activities at Site 17.

solid waste and presents the screening of those technologies based on the aforementioned criteria.

The screening process presented in Table 3-1 reduces the number of potentially applicable technologies by evaluating the advantages and disadvantages of each with respect to effectiveness, implementability, and cost. The technology screening phase is consistent with USEPA RI/FS guidance (USEPA, 1988). Because this report is focused in nature, only technologies consistent with removal, treatment, or disposal of contaminated soil were retained for assembly into remedial alternatives. Technologies deemed ineffective or not implementable were eliminated from further consideration. The remaining technologies are assembled into remedial alternatives in Section 3.2.

3.2 IDENTIFICATION, SCREENING, AND DEVELOPMENT OF REMEDIAL ALTERNATIVES. Remedial technologies that passed the technology screening phase were assembled into alternatives that meet the remedial action objectives set forth in Section 2.2. A limited number of alternatives were developed for this FFS because of the focused nature of the study.

The technologies that passed the screening step (Section 3.1) were assembled into five remedial alternatives that address source control at Site 17 (Table 3-2). To develop these alternatives, technologies for treatment and disposal of soil were combined to create alternatives that would address the remedial objectives identified in Section 2.2 (Table 3-3). A no-action alternative, typically retained as a baseline for comparison against other alternatives in an FS, was not considered for this FFS. The no-action alternative is not considered because the intent of the FFS is to address source control at Site 17 via the remediation of petroleum contaminated soils; the no action alternative is inconsistent with this goal.

Table 3-2
Identification of Remedial Alternatives

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Alternative	Excavation	Offsite Thermal Treatment of Soil	Offsite Disposal of Soil	Onsite Thermal Treatment of Soil	Ex-Situ Land Treatment of Soil	In-Situ Biological Treatment
A	X	X				
B	X		X			
C	X			X		
D	X				X	
E						X

Table 3-3
Development of Remedial Alternatives

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Alternative	Description of Key Components
Alternative A: Excavation and Offsite Thermal Treatment of Contaminated Soil	Site preparation and layout for implementation of the alternative. Excavation of contaminated soil. Sampling and analysis of soil within open excavations for characterization of remaining wastes. Transportation of soil for offsite thermal treatment and disposal. Backfilling of excavated areas with clean borrow or treated soil. Demobilization and site restoration.
Alternative B: Excavation and Offsite Disposal of Contaminated Soil.	Site preparation and layout for implementation of the alternative. Excavation of contaminated soil. Sampling and analysis of soil within open excavations for characterization of remaining wastes. Transportation of contaminated soil for offsite disposal in a RCRA subtitle D landfill. Backfilling of excavated areas with clean borrow. Demobilization and site restoration.
Alternative C: Excavation and Onsite Thermal Treatment of Contaminated Soil.	Site preparation and layout for implementation of the alternative. Excavation of contaminated soil. Sampling and analysis of soil within open excavations for characterization of remaining wastes. Treatment of soil onsite with a mobile thermal treatment unit. Backfilling of excavated areas with treated soil. Demobilization and site restoration.

Table 3-3 (Continued)
Development of Remedial Alternatives

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Alternative	Description of Key Components
Alternative D: Excavation and Onsite Ex-Situ Biological Treatment of Contaminated Soil.	Site preparation and layout for implementation of the alternative. Excavation of contaminated soil. Sampling and analysis of soil within open excavations for characterization of remaining wastes. Treatment of soils onsite by land farming, wind rows, or soil piles. Backfilling of excavated areas with treated soil. Demobilization and site restoration.
Alternative E: In-situ Biological Treatment of Contaminated Soils.	Site preparation and layout for implementation of the alternative. Installation of wells for injection of air and nutrients. Operation of air sparging/bioventing. Sampling and analysis of soil to demonstrate cleanup and for characterization of remaining wastes. Demobilization and site restoration.

The alternatives that were developed for Site 17 were then screened based on cost, effectiveness, and implementability. A brief summary of this screening step is presented on Table 3-4. For the purpose of the FFS, "offsite" is defined as off the NAS Cecil Field property.

Table 3-4
Screening of Source Control Remedial Alternatives

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Alternative Option	Screening Summary and Rationale	Status
Alternative A: Excavation and Offsite Thermal Treatment of Contaminated Soil.	This alternative would provide destruction of contaminants in soil via volatilization and incineration or vapors. Residuals would be placed within an offsite secure landfill. Offsite treatment will be compared with onsite thermal treatment by a mobile unit in Alternative C.	Retained as **Alternative RA-1.**
Alternative B: Excavation and Offsite Disposal of Contaminated Soil.	This alternative would provide a disposal option for contaminated soils in a location where the soils could neither contaminate groundwater or pose a risk to human health and the environment. Destruction of contaminants would not be achieved. Space limitations at landfills may be encountered and costs are higher than for treatment of options.	Eliminated due to lack of treatment and high cost.
Alternative C: Excavation and onsite Thermal Treatment of Contaminated Soils.	This alternative would provide destruction of contaminants in soil via volatilization and incineration of vapors. Residual ash from the afterburner would be placed within an offsite landfill. This alternative will be compared with the offsite thermal treatment (Alternative A) for cost effectiveness and implementability.	Retained as **Alternative RA-2.**
Alternative D: Excavation and Onsite Ex-Situ Biological Treatment of Contaminated Soil.	This alternative provides for excavating contaminated soil and treatment onsite by a biological treatment method (landfarming, wind rows, or soil piles). Contaminants would be destroyed by microbial degradation of organic compounds. Treatment residuals (primarily treatment pad materials) would be generated and would have to be disposed of in an offsite landfill. This alternative will be compared with thermal treatment (Alternative C) for cost effectiveness and destruction of contaminants.	Retained as **Alternative RA-3.**
Alternative E: In-situ Biological Treatment of Contaminated Soil.	This alternative provides for treatment of contamination through destruction by microorganisms. This alternative would provide an effective treatment for the types of contaminants found at Site 17 and will be compared with the ex-situ biological treatment (Alternative D).	Retained as **Alternative RA-4.**

Note: RA = remedial alternative.

The detailed analyses of the four alternatives that passed the screening step are presented in Chapter 4.0.

4.0 DETAILED ANALYSES OF ALTERNATIVES

The alternatives for remediation of contaminated soil at Site 17 are evaluated in detail in this chapter. This detailed evaluation of each remedial alternative includes the following:

- a detailed description of the alternative emphasizing the applications of the technologies, and
- a detailed analysis of the alternative against the nine criteria outlined in the NCP (40 CFR 300.430(e)(9)(iii).

The remedial alternatives were examined with respect to the requirements stipulated by the NCP and factors described in the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA, 1988). The nine technical criteria from the RI/FS guidance document are:

- overall protection of human health and the environment;
- compliance with ARARs;
- long-term effectiveness and permanence;
- reduction in mobility, toxicity, or volume of contaminants;
- short-term effectiveness;
- implementability;
- cost;
- State acceptance; and
- community acceptance.

Because the State (FDEP) and USEPA have participated in the review and have concurred with the issuance of this FFS, the only criterion not specifically addressed is community acceptance. Community acceptance will be addressed upon receipt of public comments on the Proposed Plan (USEPA, 1988). The responsiveness summary and the Proposed Plan will address community acceptance. This FFS focuses on the first seven criteria in the alternative evaluation process.

CERCLA 121(c) requires that any site where a remedial action that results in hazardous substances, pollutants, or contaminants remaining onsite is implemented must be reviewed every 5 years. This requirement will be addressed in the overall FS for OU 2 at NAS Cecil Field.

4.1 ALTERNATIVE RA-1: EXCAVATION AND OFFSITE THERMAL TREATMENT OF CONTAMINATED SOIL.

4.1.1 Description This alternative would consist of the excavation of contaminated soil from Site 17 with subsequent transportation and offsite thermal treatment of contaminated soil. The excavation would then be backfilled with clean soil.

A process-flow diagram for this alternative is provided on Figure 4-1. Major activities associated with this alternative include:

- site clearing and preparation,
- excavation of contaminated soil,

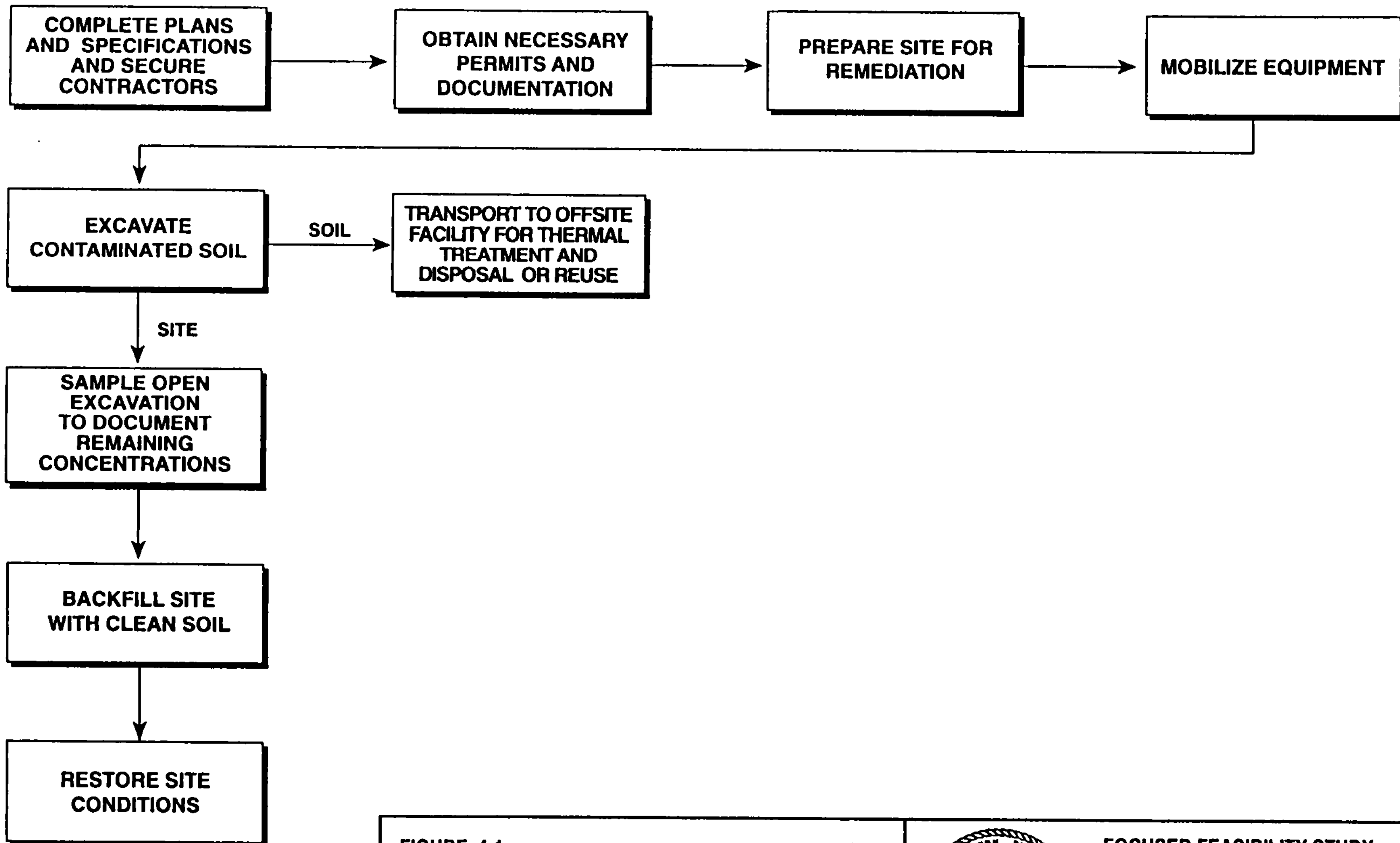


FIGURE 4-1

PROCESS FLOW DIAGRAM FOR ALTERNATIVE RA-1, EXCAVATION AND OFFSITE TREATMENT OF CONTAMINATED SOIL

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

8520-26 940323WEM

000458

- sampling of soil in open excavation,
- transportation of soil to an offsite thermal treatment unit,
- backfilling of excavated areas, and
- demobilization and site restoration.

A site layout for this alternative is provided on Figure 4-2.

Site Clearance and Preparation. Site clearing and preparation would include all activities and construction necessary prior to excavation of contaminated soil at the site. These activities would include:

- collection and documentation of compliance with substantive requirements of typical permits prior to the onset of intrusive work at Site 17,

- construction of a temporary fence controlling access and representing the limits of Site 17 during remedial activities,

- establishment of a field office,

- clearing of vegetation within the fenced area,

- setup of a decontamination area and laydown area for equipment, and

- establishment of a staging area for handling excavated soils.

Although permits are typically waived for remedial activities conducted entirely onsite at CERCLA sites, the intent of any construction or work permits that would normally be necessary prior to implementation of the alternative must be considered. There are no utilities at Site 17. A temporary construction fence would be installed at Site 17 to enclose the excavation area and to limit access to the excavation area. A gate facing Perimeter Road at Site 17 would be provided and would allow entry and exit of vehicles and equipment throughout the implementation of this alternative. Hazard signs would be posted at regular intervals along the fence to warn NAS Cecil Field personnel of the hazards associated with the site. Vegetation, including trees and shrubs, within the fenced area would be cleared.

An area for decontamination of equipment would be constructed with a protective, waterproof tarpaulin (e.g., polymeric material) including a berm to contain waters generated during decontamination activities. Equipment staged near the decontamination area would include a clean storage closet, a steam cleaner for equipment decontamination, a pressure washer for the treatment of equipment, a water tank, a rolloff bin, and a temporary holding tank to collect water generated during decontamination.

Excavation of Contaminated Soil. Excavation of contaminated soil would begin following the completion of site clearing and preparatory activities. The excavation activities at Site 17 would be focused within the area identified in Section 2.2.

A backhoe would be used to excavate the contaminated soil. The soil would be placed directly into rolloff bins for subsequent transportation to an offsite permitted thermal treatment facility. Dewatering of soil would not be required as excavation would be limited to soils in the vadose zone. The volume of soil

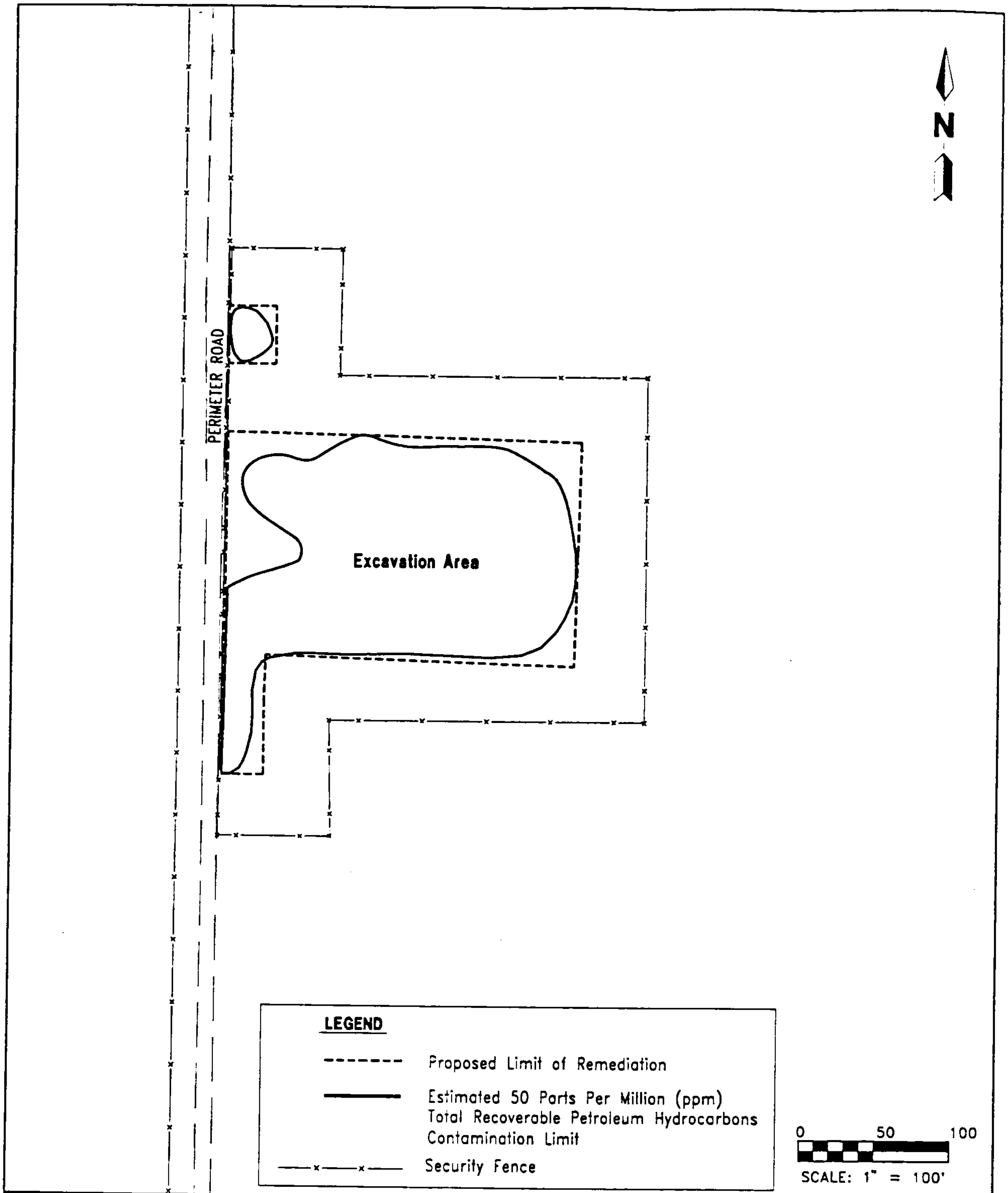


FIGURE 4-2
SITE LAYOUT, ALTERNATIVE RA-1

CECIL/FFS/FS-4_2.dwg/NP/3-25-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

requiring removal during this interim remedial action is estimated to be 9,870 yd^3 for excavation to 8 feet bls (see Section 2.2) based on the removal of soil with TRPH concentrations above 50 ppm.

To prevent excavation walls from caving in and to protect workers at the bottom of the excavation, it is anticipated that the excavation would be sloped at a 2:1 horizontal to vertical ratio along the sides of the excavation. This results in an additional volume of soil to be excavated in order to remove the contaminated soils; however, this soil is outside the limits of remediation based on the soil action level (50 ppm TRPH) and would be separated and returned to the site untreated during backfilling.

Excavation would also proceed in a manner to avoid damage to deep monitoring well 17-28DD. Other monitoring wells within the excavation may be abandoned if they hinder excavation or are damaged by heavy equipment. For cost estimating purposes, it was assumed that 10 monitoring wells would be abandoned during excavation and replaced at the completion of the alternative.

Post-Excavation Soil Characterization. To document the contaminant concentrations, a set of soil samples would be collected from the open excavation. Samples would be collected from the sideslopes of the excavation above the water table. Soils on the floor of the excavation would not be sampled because they would be below the water table and will be addressed as part of the Final FS that addresses groundwater contamination.

All of the samples collected will be analyzed for TRPH to determine if soils are above or below 50 ppm. Ten percent, or five samples (whichever is greater), will be analyzed for TCL VOCs, TCL SVOCs, and inorganics to further characterize remaining soils.

Post-excavation soil samples would be collected and analyzed for characterization purposes only. Remediation would not be extended to additional soils based on the samples as part of this interim remedial action.

Transportation and Offsite Treatment of Contaminated Soil. Contaminated soil would be placed directly into rolloff bins upon excavation. Transportation of soil to the offsite thermal treatment unit would be ongoing throughout the time span of soil excavation activities at Site 17. For the purposes of cost estimating, it was assumed that the soil would be non-hazardous and would be transported to the Anderson Columbia treatment facility in Lake City, Florida. A typical process flow diagram for a thermal treatment system is shown in Figure 4-3.

Because most thermal treatment vendors specify that soil entering the treatment unit be smaller than a certain size (for ease of handling and protection of the equipment), oversized material such as rocks and concrete are frequently screened out and separated prior to treatment. The soils at Site 17 are mostly sands. Rocks and debris are not anticipated; however, if these are encountered during excavation, a screening step may be required that could increase the remedial cost.

At the treatment facility, the soil would be fed into the primary treatment chamber typically at a maximum rate of 35 to 40 tons per hour. In the primary treatment chamber the soil would be indirectly heated to a temperature high

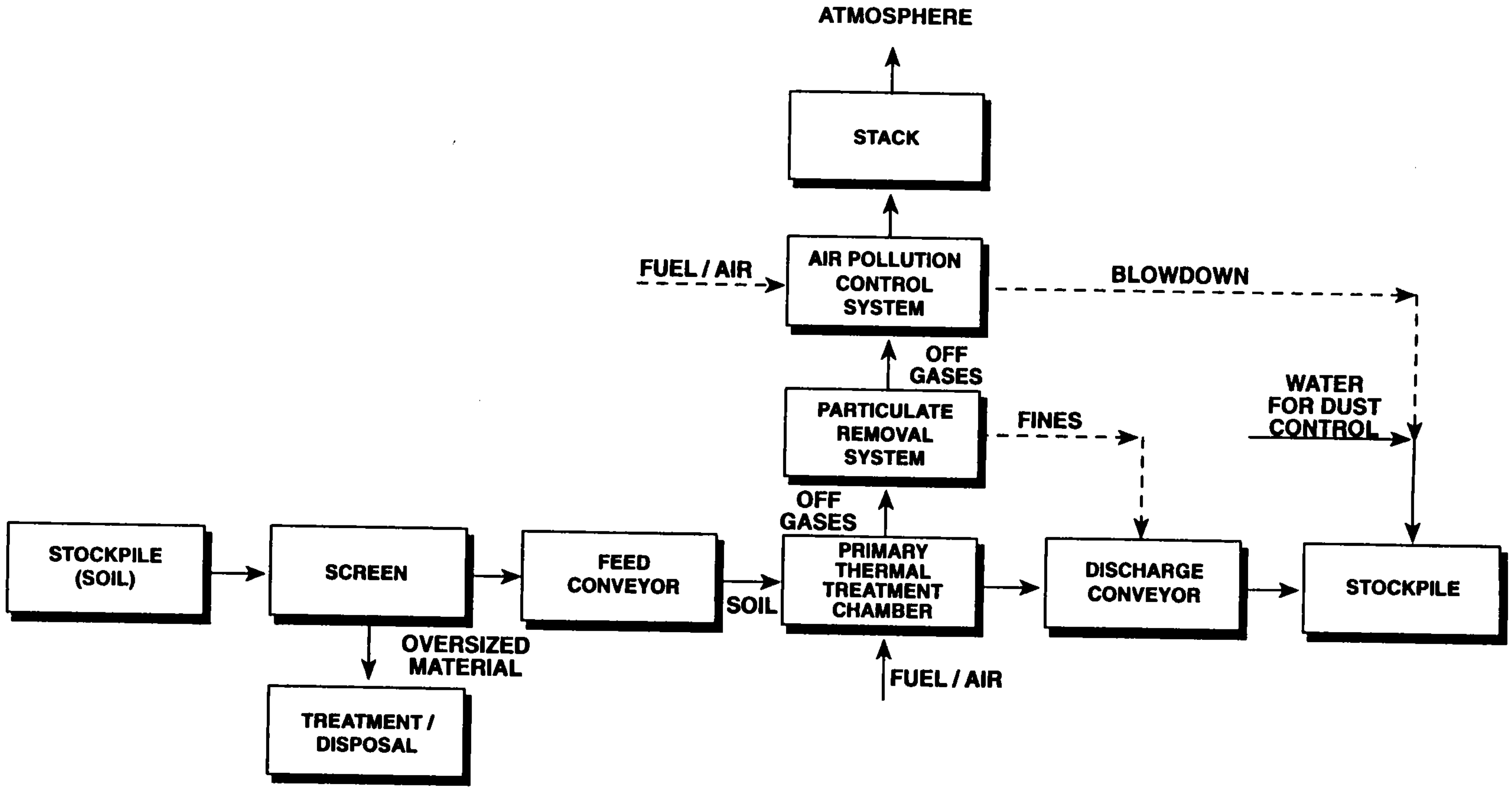


FIGURE 4-3

PROCESS FLOW DIAGRAM FOR A TYPICAL THERMAL TREATMENT UNIT

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

8520-26 940323WEM

000458

enough to volatilize contaminants, but low enough to prevent combustion (typically between 250 and 600 degrees Fahrenheit [°F]).

Soil passing through the primary treatment chamber would be discharged to a treated soil stockpile. Water would be sprayed on the soil to control dust. Treated soil would be sampled and analyzed based on the facility's permit.

Air pollution control equipment is typically necessary to remove particulate matter and to destroy volatilized organics in the gas stream. Typical air pollution control equipment includes baghouses and afterburners. Baghouses remove particulates by filtration. Afterburners consist of a condenser to remove water vapor followed by combustion at 1,800 to 2,400 °F to destroy organics. Air emissions are typically monitored for regulatory compliance.

Disposal or reuse of treated soils from the offsite thermal treatment vendor are the responsibility of the vendor. The vendor may make the soil available as backfill material.

<u>Backfilling of Excavated Areas</u>. Open excavations would be backfilled with clean borrow. There is some potential for groundwater to recontaminate backfilled soils; however, recontamination is expected to be on the order of 2 to 3 ppm (see calculations in Appendix E).

<u>Closeout Activities</u>. Once excavation, treatment, and backfilling activities at Site 17 are concluded, closeout activities would occur. Closeout activities at Site 17 would include:

- testing and appropriate disposal of water generated during decontamination activities;

- removal and cleanup of the decontamination area, clean fill staging area, and equipment; and

- replacement of monitoring wells.

Decontamination water would be pumped into a holding tank staged onsite. Once remedial activities are completed at Site 17, this water would be tested for RCRA characteristics. If the analytical results indicate that the water is not an RCRA characteristic waste, the water would be transported to the NAS Cecil Field wastewater treatment plant for management. If the analytical results indicate the water is an RCRA characteristic waste, the water would be transported offsite for treatment in accordance with appropriate regulations. For cost estimating purposes, it was assumed that the water would not be a hazardous waste.

Future remedial activities may be implemented for Site 17. However, site improvements such as repair of damages, if any, to the dirt road and reseeding would still be incorporated as a final step in this interim source control remedial alternative and abandoned monitoring wells may be replaced. For cost estimating purposes, it was assumed that all 10 monitoring wells would be replaced.

4.1.2 Technical Criteria Assessment

Overall Protection of Human Health and the Environment. This alternative would provide increased protection of human health and the environment because it would reduce the amount of contamination present in the soils that could pose a direct contact risk or ecological risk. Removal of contaminated soils would also reduce the source of contamination to groundwater, which, over the long-term, would reduce risk associated with consumption of contaminated groundwater. A risk assessment has not been completed for Site 17, so it is not possible to evaluate the risk levels following implementation of this alternative. Some short-term and cross-media effects are possible with this alternative as a result of volatilization during soil handling and the potential for exposure during transportation activities.

Compliance with ARARs. Source removal and treatment activities outlined in Alternative RA-1 would comply with ARARs identified in Section 2.1. All wastes removed from the site during the remedial action would be managed according to these ARARs.

Long-term Effectiveness and Permanence. This alternative would be effective in the long-term and will be permanent because contaminated soil in the vadose zone that is currently acting as a source of contamination will be removed from the site. Organic contaminants removed from the site will be destroyed at a permitted facility. An evaluation of the residual risk to human health and the environment at Site 17 would be performed as part of the RI/FS for the site that addresses both soils and groundwater. The remediation of any residual risk with remaining contamination will be addressed as a part of the overall FS for OU 2. Thermal treatment provides a highly reliable and permanent treatment of contaminants. There is a possibility that contamination in groundwater may contaminate the clean soils used to backfill the excavation.

Reduction of Mobility, Toxicity, or Volume. This alternative would reduce the toxicity, mobility, and volume of the contaminants at Site 17 because contaminated soil would be removed from the site and treated by a process that destroys the organic contaminants. A total of 9,870 yd^3 of soils would be removed from the site containing an estimated 5,785 kilograms of TRPH that would be treated for excavation to 8 feet bls. Small amounts of contaminants could also end up in residual waste streams such as water used to decontaminate debris and equipment and ash produced by the afterburning of vapors from the thermal treatment system, or be volatilized to the atmosphere during excavation and handling. Treatment residuals generated by the thermal treatment unit would be handled by the offsite treatment vendor according to their permit and regulations.

Short-term Effectiveness. Removal of contaminated soil from Site 17 would minimize potential future exposure of human and ecological receptors to contaminants in the soil and would immediately reduce a source of contamination at the site.

NAS Cecil Field personnel have indicated that Site 17 is generally a low-traffic area. Nonetheless, access to Site 17 would be limited during site preparation, construction, and excavation activities. If necessary, engineering controls, such as keeping soils moist and covering soil piles, would be used for dust control during construction and excavation activities. Remedial activities would be carried out in the appropriate level of personal protective equipment (PPE) required, which was assumed to be modified Level D. Dust monitoring would be required during excavation activities. Construction fencing would be installed around the perimeter of the site to restrict public access. In addition to a public information program, signs warning the public of the potential danger of hazardous materials would be posted on the fence to further discourage unauthorized access to the site. Minimal environmental effects are expected for this alternative. There is some risk to the public as a result of transportation activities. Completion of this alternative is expected to take 3 months.

Implementability. Equipment and services necessary for the removal and treatment of contaminated soil at Site 17 are readily available. However, if soils at Site 17 are found to be characteristically hazardous, then local offsite thermal treatment vendors may not accept the soils. This could delay implementation while arrangements are made to transport soils to more distant treatment facilities permitted to accept RCRA hazardous wastes. There is no indication from past soil analyses that soils would be found to be characteristically hazardous as discussed in Section 2.2.

Site 17 is accessible from existing roads. Though visual observations indicate that there is little day-to-day activity at and around Site 17, activities would be carried out to minimize the disruption to normal daily activities at NAS Cecil Field. At this time, it is not anticipated that it will be necessary to restrict traffic on Perimeter Road during implementation of this alternative. To maximize the size of the vadose zone that is remediated, this alternative would have to be implemented during the seasonal low water table anticipated to be during the summer months.

Cost. Table 4-1 presents the cost estimate for this alternative. Cost calculations are provided in Appendix F. The total cost of Alternative RA-1 including contingency was estimated to be $1,376,000 based on an 8-foot excavation. No operation and maintenance (O&M) costs or present worth analyses were included in the cost estimate due to the short project life span. Treatment costs represent approximately 34 percent of total capital costs. Prices were rounded to the nearest $1,000 for all cost estimates provided in this FFS.

4.2 ALTERNATIVE RA-2: EXCAVATION AND ONSITE THERMAL TREATMENT OF CONTAMINATED SOIL.

4.2.1 Description This alternative would consist of excavation of contaminated soil from Site 17 with subsequent onsite thermal treatment of contaminated soil. A process-flow diagram for this alternative is provided on Figure 4-4. Major activities associated with this alternative include:

- site clearing and preparation,
- excavation of contaminated soil,
- sampling of soil within open excavations,
- treatment of contaminated soils onsite,
- backfilling of excavated areas with treated soil, and
- demobilization and site restoration.

A site layout for the alternative is shown in Figure 4-5. This alternative would include an onsite treatment location. The excavation part of this alternative

Table 4-1
Summary of Cost Estimate for Alternative RA-1: Excavation and Offsite Thermal Treatment of Contaminated Soil

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Capital Costs	Amount
Direct	
1. Site preparation and construction	$50,000
2. Site management	$82,000
3. Remedial activities	$762,000
4. Closure activities	$26,000
Total Direct Cost	$920,000
Indirect	
Health and safety (5 percent of direct cost)	$46,000
Legal, administrative, and permitting (5 percent of direct cost)	$46,000
Engineering (10 percent of direct cost)	$92,000
Services During Construction (10 percent of direct cost)	$92,000
Total Indirect Cost	$276,000
Subtotal, Capital Costs (Direct plus Indirect)	$1,196,000
Contingency (15 percent of subtotal)	$179,000
Total Cost of Alternative RA-1	$1,376,000

Notes: Prices have been rounded to the nearest $1,000 for this estimate. Totals may differ from those shown in Appendix F due to rounding.

Health and safety cost assumes that site operations would be carried out in modified Level D personal protection equipment (PPE) (i.e., dermal protection).

No present-worth analysis was completed due to brief project duration.

Backup calculations are provided in Appendix F.

CFSite17.FFS
MVL.06.94

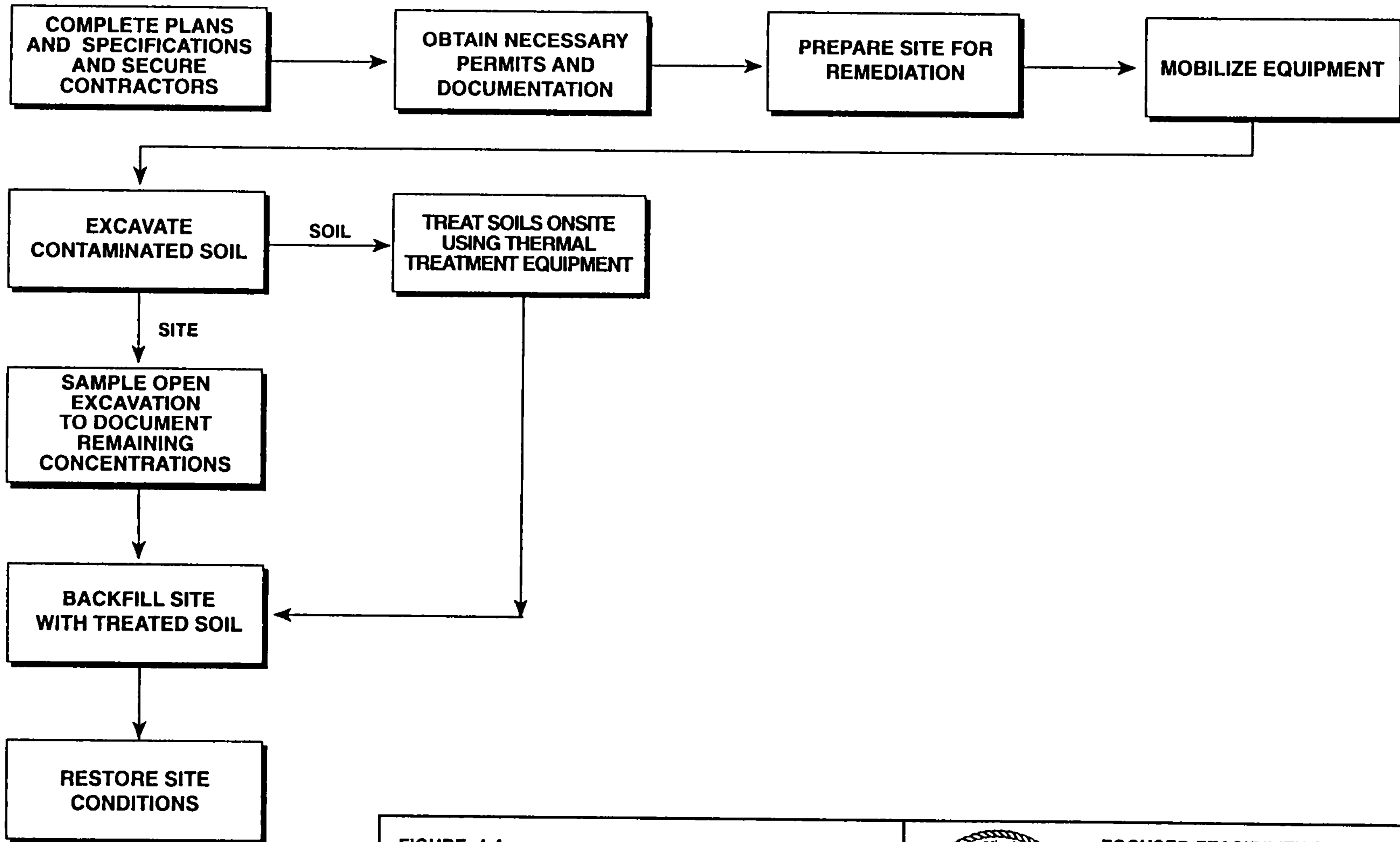


FIGURE 4-4

PROCESS FLOW DIAGRAM FOR ALTERNATIVE RA-2, EXCAVATION AND ONSITE THERMAL TREATMENT OF CONTAMINATED SOIL

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

8520-26 940323WEM

00458

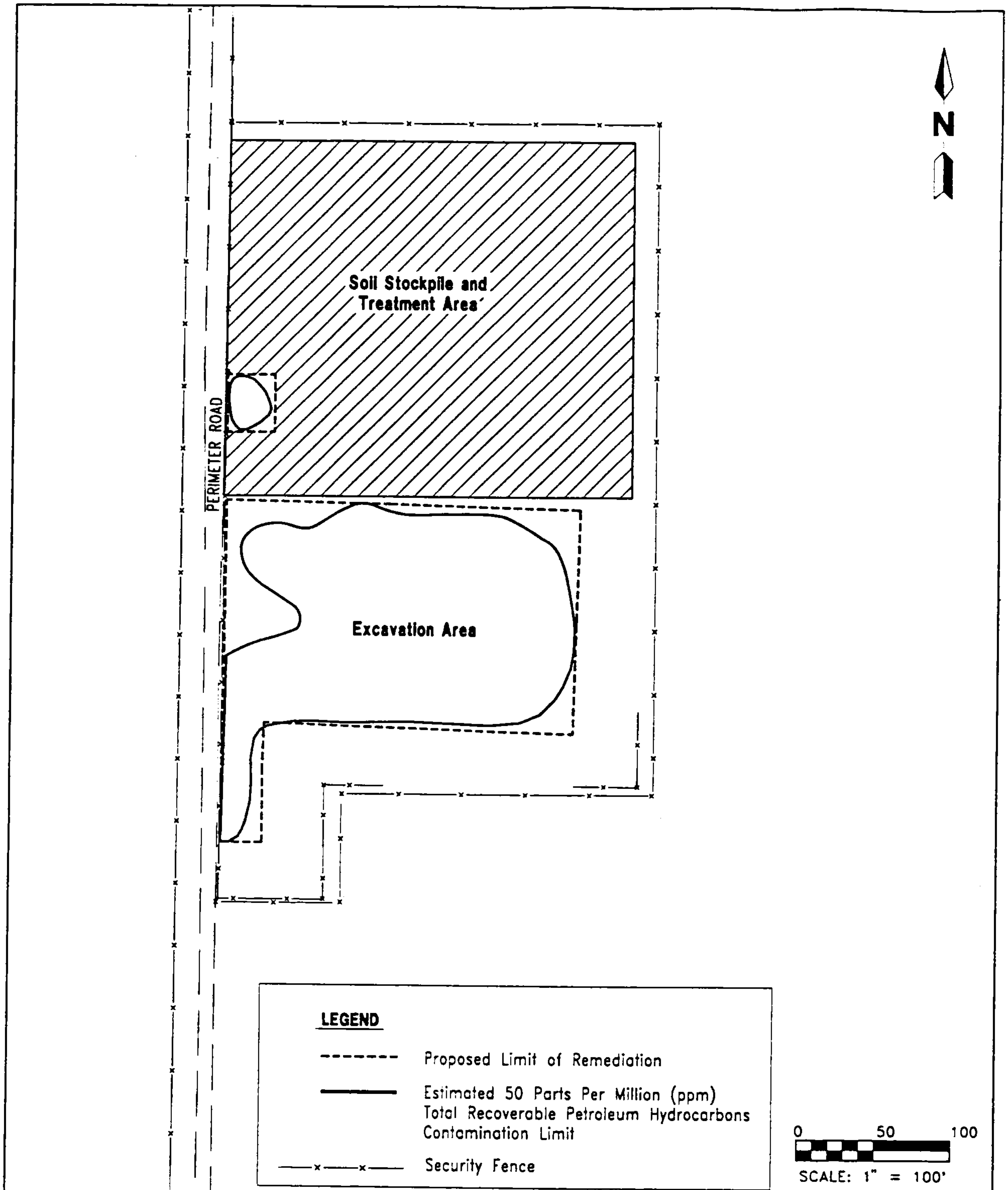


FIGURE 4-5
SITE LAYOUT, ALTERNATIVE RA-2

CECIL/FFS/FS-4_2.dwg/NP/3-25-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

is identical to Alternative RA-1. Activities associated with the onsite treatment portion of this alternative are described in the following paragraphs.

Onsite Thermal Treatment of Contaminated Soil. A mobile thermal desorption treatment unit would be transported to and set up at the site. Space requirements include 2,000 square feet (ft^2) for the treatment unit and appurtenances and 1.5 acres for stockpiling soils before and after treatment. The onsite thermal treatment option uses the same technology to remove and destroy contaminants as the offsite option (Alternative RA-1). Soils would be treated, sampled, and stockpiled. Upon receipt of analyses the soils would be returned to Site 17 for backfilling or reprocessed if treatment goals are not reached. The sampling of treated soils for an onsite unit is different from an offsite unit in that it demonstrates compliance with treatment criteria for site-specific soils whereas the offsite unit demonstrates general compliance but may include a mix of soils from different sites. Ash generated by the offgas treatment would require disposal at an offsite landfill.

Backfilling of Excavated Areas. Open excavations would be backfilled and compacted with treated soil. Recontamination of backfilled soils would be similar to that described for Alternative RA-1.

4.2.2 Technical Criteria Assessment The technical criteria assessment for this alternative is identical to that of Alternative RA-1 with three exceptions, which are discussed in the following paragraphs.

Short-term Effectiveness. In addition to the measures discussed in Alternative RA-1, additional air monitoring would be required during treatment activities. The addition of a treatment and soil staging area would result in a larger area and more construction fencing around the perimeter of the site to restrict public access. Completion of this alternative is expected to take 3 months.

Implementability. Equipment and services necessary for the removal and treatment of contaminated soil at Site 17 are readily available. Compared with Alternative RA-1, this alternative would require additional preparation to set up the onsite treatment equipment.

Cost. Table 4-2 presents the cost estimate for this alternative. Cost calculations are provided in Appendix F. The total cost of Alternative RA-2 including contingency was estimated to be $1,374,000 based on an 8-foot excavation. No O&M costs or present worth analyses were included in the cost estimate due to the short project life span. Treatment costs represent approximately 41 percent of total capital costs. Prices were rounded to the nearest $1,000 for all cost estimates provided in this FFS.

4.3 ALTERNATIVE RA-3: EXCAVATION AND ONSITE BIOLOGICAL TREATMENT OF CONTAMINATED SOIL.

4.3.1 Description This alternative would consist of excavation of contaminated soil from Site 17 with subsequent onsite biological treatment of contaminated soil. A process-flow diagram for this alternative is provided on Figure 4-6. Major activities associated with this alternative include:

- site clearing and preparation,

Table 4-2
Summary of Cost Estimate for Alternative RA-2: Excavation and Onsite Thermal Treatment of Contaminated Soil

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Capital Costs	Amount
Direct	
1. Site preparation and construction	$54,000
2. Site management	$82,000
3. Remedial activities	$754,000
4. Closure activities	$29,000
Total Direct Cost	$919,000
Indirect	
Health and safety (5 percent of direct cost)	$46,000
Legal, administrative, and permitting (5 percent of direct cost)	$46,000
Engineering (10 percent of direct cost)	$92,000
Services During Construction (10 percent of direct cost)	$92,000
Total Indirect Cost	$276,000
Subtotal, Capital Costs (Direct plus Indirect)	$1,195,000
Contingency (15 percent of subtotal)	$179,000
Total Cost of Alternative RA-2	$1,374,000

Notes: Prices have been rounded to the nearest $1,000 for this estimate. Totals may differ from those shown in Appendix F due to rounding.

Health and safety cost assumes that site operations would be carried out in modified Level D personal protection equipment (PPE) (i.e., dermal protection).

No present-worth analysis was completed due to brief project duration.

Backup calculations are provided in Appendix F.

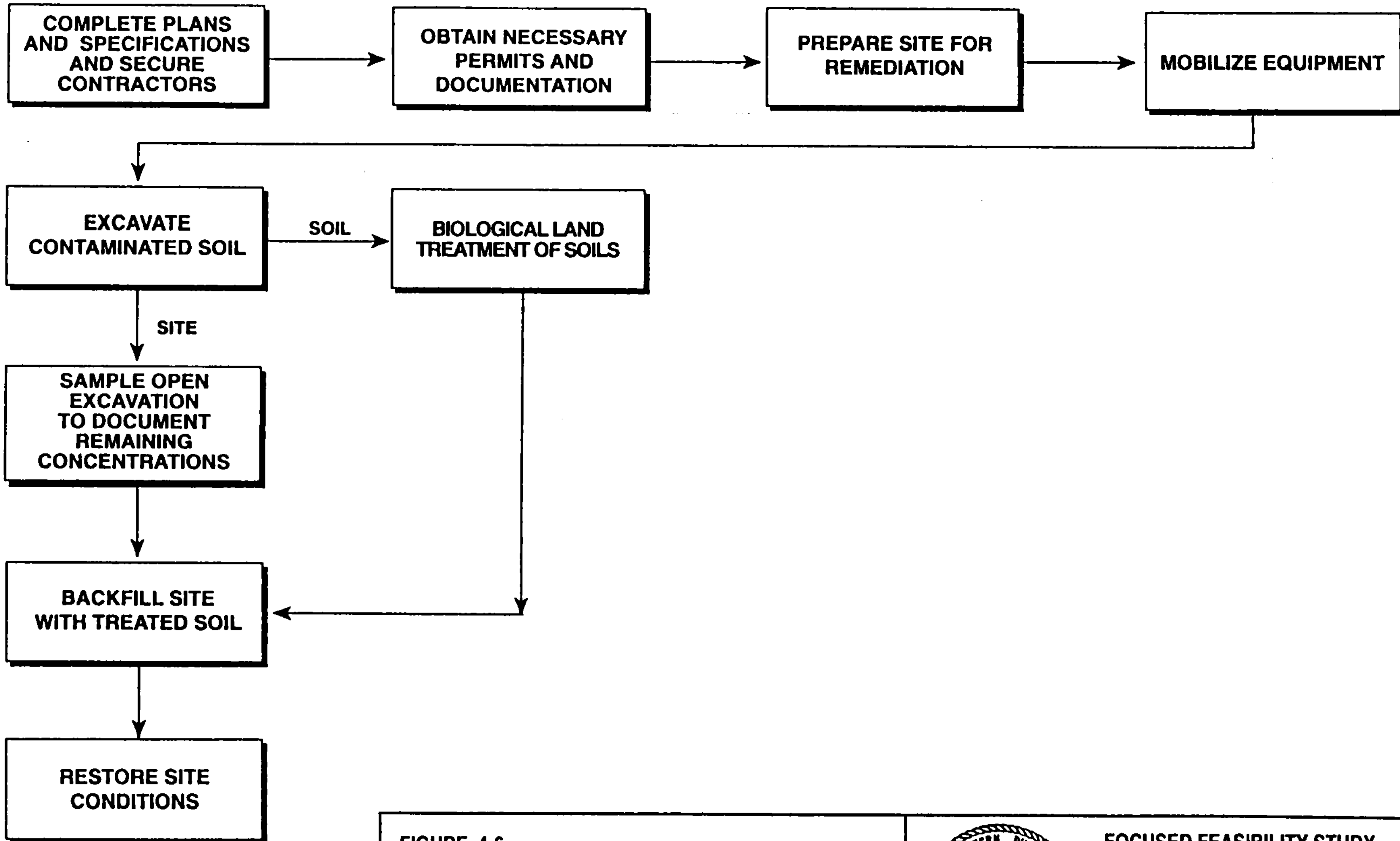


FIGURE 4-6

PROCESS FLOW DIAGRAM FOR ALTERNATIVE RA-3, EXCAVATION AND EX-SITU BIOLOGICAL TREATMENT OF CONTAMINATED SOIL

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

8520-26 940323WEM

- excavation of contaminated soil,
- sampling of soil within open excavations,
- onsite biological treatment of contaminated soil,
- backfilling of excavated areas with treated soil, and
- demobilization and site restoration.

A site layout for this alternative is shown in Figure 4-7. This alternative is identical to Alternative RA-2, with the exception that soils would be treated by biological methods. This treatment is discussed in the following paragraphs.

Onsite Biological Treatment of Contaminated Soil. Biological land treatment consists of creating optimal microbial conditions in excavated soil through the mechanical mixing of the soil and the addition of amendments. Land treatment takes place in a constructed cell that is lined and bermed to prevent the migration of contaminants. Two types of land treatment could be implemented at Site 17, landfarming and windrow land treatment. Both land treatment methods are similar except that landfarming uses lifts to set up and mix soils, whereas windrow land treatment uses windrows for these same purposes. This alternative proposes use of the windrow land treatment method because it offers better space utilization (windrows instead of a single soil lift), and more complete mixing (horizontal augering instead of plowing and disking) than landfarming. The individual components of the windrow land treatment are described in the following paragraphs.

Construction of Treatment Pad. Excavated soil would be placed on the prepared treatment pad for biological treatment. The purpose of a treatment pad is to allow aboveground treatment of soil, while preventing offsite migration of contaminated soil or water. The primary components of a treatment pad include an impenetrable layer (a flexible membrane liner [FML] or clay), a drainage layer (geotextile and sand, or gravel), and the treatment layer (contaminated soil). In some cases, another separation layer, usually sand, is placed between the drainage layer and the treatment layer. Additional components of the treatment pad include a water collection, storage, and delivery system and temporary fencing.

Excavation and Construction of Soil Windrows. Upon completion of the treatment pad, soil windrows can be constructed on the pad. As soils are excavated from the contaminated area, they would be transported directly (by dump truck or front-end loader) to the treatment pad. Once on the treatment pad, the soils would be spread out to a depth of approximately 19 inches using bulldozers or front-end loaders. Soil amendments such as lime and nutrients would be manually added to the soil as it is spread upon the treatment pad. Treatment is expected to take place in three 3,300 yd^3 batches of soil, so excess soil from the excavation would be stockpiled on the pad. Once all soil for a batch has been amended and spread on the treatment pad, a horizontal auger would travel through the spread soil and form windrow piles. These windrow piles would vary from 6 to 10 feet wide and 24 to 40 inches high, depending on the size of the auger. It is estimated that approximately 23 windrows would be formed on the treatment pad, each approximately 250 feet long and spaced 2 feet apart to treat 3,300 yd^3 of soil with an auger that can form 10-foot wide, 42-inch tall windrows. Upon formation of the windrows, the soils would be watered using a water distribution system.

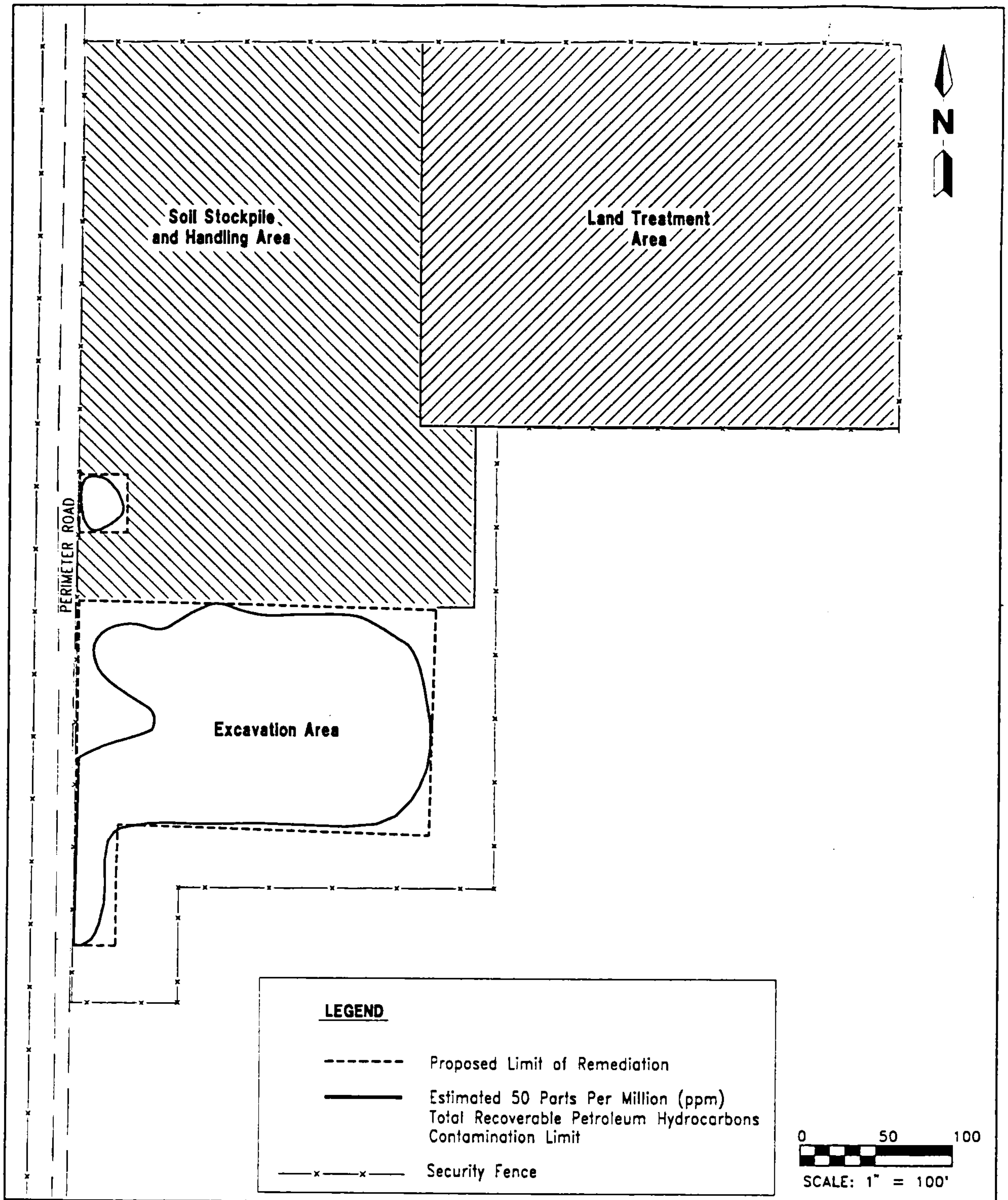


FIGURE 4-7
SITE LAYOUT, ALTERNATIVE RA-3

CECIL/FFS/FS-4_2.dwg/NP/3-25-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Operation of Windrow Treatment System. Operation of the windrow land treatment system will consist of turning (mixing) the soil windrows to provide oxygen; maintain proper soil pH, nutrient, and moisture levels; and monitor for contamination reduction and biological activity. Soil mixing would be performed using the horizontal auger once every 5 to 7 days. pH, nutrient, and moisture levels would be monitored and adjusted as needed.

Monitoring of soil TRPH concentrations and bacteria enumerations would be required as part of the biological remedial operation to determine the efficacy of the bioremedial operation. Composite samples, consisting of several grab samples from various points in a windrow, would be taken from several windrows on the treatment pad for TRPH and bacterial analyses. Soil TRPH concentrations would be determined using modified USEPA Method 418.1 TRPH analyses. Approximately four TRPH analyses would be taken per week (1 per 1,000 yd^3 soil). In addition, GC/FID fingerprint analyses (modified USEPA Method 3550/8100) would be conducted at a rate of four samples every 2 weeks, to monitor the progress of operation. Enumerations of total and petroleum-specific bacteria can be quantified using standard plating procedures. Decline in TRPH concentrations and increase in total and petroleum-specific bacteria over time are indications that removal of organic contaminants is occurring. Non-decline in TRPH concentrations and no increase in bacteria populations may indicate that soil environmental conditions are not optimal or that other limiting conditions exist.

Bioremediation of Site 17 soils would cease when cleanup criteria have been achieved. Although more accurate predictions of treatment time can only be made through bench or pilot-scale tests, it is estimated that it will require approximately 120 days to biologically remediate one batch of Site 17 soil. Closeout analyses conducted by a certified analytical laboratory would determine when bioremediation of Site 17 soils is complete. A sample rate of one soil sample per 200 yd^3 of soil is recommended to adequately determine the overall TRPH concentrations in a single soil batch. Samples would be analyzed to evaluate compliance with the treatment standards specified for thermal treatment units. At the conclusion of the remediation, the treatment pad would be removed and the membrane liners disposed at an offsite landfill.

4.3.2 Technical Criteria Assessment The technical criteria assessment for this alternative is identical to that of Alternative RA-2 with two exceptions, which are discussed in the following paragraphs.

Short-term Effectiveness. Removal of contaminated soil from Site 17 would minimize potential future exposure of human and ecological receptors to contaminants in these media and would immediately reduce a source of contamination. Dust emissions would be monitored during remediation. This alternative is expected to take 14 months to complete.

Cost. Table 4-3 presents the cost estimate for this alternative. Cost calculations are provided in Appendix F. The total cost of Alternative RA-3 including contingency was estimated to be $1,176,000. No O&M costs were included in the overall cost estimate due to the short project life span. Treatment costs represent approximately 27 percent of total capital costs. Prices were rounded to the nearest $1,000 for all cost estimates provided in this FFS.

Table 4-3
Summary of Cost Estimate for Alternative RA-3: Excavation and Onsite Ex-situ Biological Treatment of Contaminated Soil

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

	Amount
Capital Costs	
Direct	
1. Site preparation and construction	$102,000
2. Site management	$96,000
3. Remedial activities	$558,000
4. Closure activities	$31,000
Total Direct Cost	$787,000
Indirect	
Health and safety (5 percent of direct cost)	$39,000
Legal, administrative, and permitting (5 percent of direct cost)	$39,000
Engineering (10 percent of direct cost)	$79,000
Services During Construction (10 percent of direct cost)	$79,000
Total Indirect Cost	$236,000
Subtotal, Capital Costs (Direct plus Indirect)	$1,023,000
Contingency (15 percent of subtotal)	$153,000
Total Cost of Alternative RA-3	$1,176,000

Notes: Prices have been rounded to the nearest $1,000 for this estimate. Totals may differ from those shown in Appendix F due to rounding.

Health and safety cost assumes that site operations would be carried out in modified Level D personal protection equipment (PPE) (i.e., dermal protection).

No present-worth analysis was completed due to brief project duration.

Backup calculations are provided in Appendix F.

4.4 ALTERNATIVE RA-4: *IN-SITU* BIOLOGICAL TREATMENT OF CONTAMINATED SOIL

4.4.1 Description

This alternative would consist of promoting *in-situ* biological remediation of contaminated soils at Site 17. A process flow diagram for this alternative is provided on Figure 4-8. Major activities associated with this alternative include:

- site clearing and preparation,
- air sparging/bioventing to remediate subsurface soils,
- monitoring of remediation, and
- demobilization and site restoration.

Each of the components listed above are described in the following paragraphs.

Site Clearing and Preparation. Site clearing and preparation activities would be similar to those described for the other alternatives with the exception that a smaller area would be required for implementation of this alternative.

Air Sparging and Bioventing of Subsurface Soils. Alternatives RA-1 through RA-3 address vadose zone soils down to an 8-foot depth by scheduling excavation activities to occur during seasonal low groundwater. It is possible to address these same soils by air sparging and bioventing during the seasonally high groundwater; however, treatment in this case occurs monthly under saturated conditions.

Air sparging and bioventing is an emerging, innovative, *in-situ* technology that can be used to remediate saturated soils and groundwater contaminated with many organic compounds. The technology consists of forcing air into the area of contamination in the saturated zone. As the air is injected into the subsurface, it travels vertically and horizontally. The degree of horizontal movement is dependent on site-specific soil characteristics. As the air migrates, there are two potential remedial mechanisms that can occur. Volatile compounds that are present in the groundwater or soils can vaporize into the air and be carried to the vadose zone. Although this may occur to some extent, it will not be the primary remediation method intended by this alternative. The remediation that is intended occurs by dissolution of oxygen from the injected air into the groundwater, which provides the electron acceptor necessary for enhanced aerobic biological destruction of petroleum-related organic compounds.

Volatilization and biological degradation are linked removal methods that cannot be totally separated from each other with air sparging; however, most of the organics present in the soils and groundwater at Site 17 are SVOCs, which would limit removal by volatilization and increase the likelihood of removal by biological processes. In addition, no vapor extraction wells would be included in this alternative because they have the effect of enhancing the movement and volatilization of contaminants. Air supply rates would also be kept lower than would be necessary for volatilization as a primary removal method. It would be necessary as part of this alternative to provide monitoring to evaluate to what extent volatilization and biodegradational activities are occurring.

All of the design factors for air sparging are highly dependent on site-specific conditions, and accurate predictive methods for this technology have not been established. It is typically necessary to conduct pilot testing to determine the

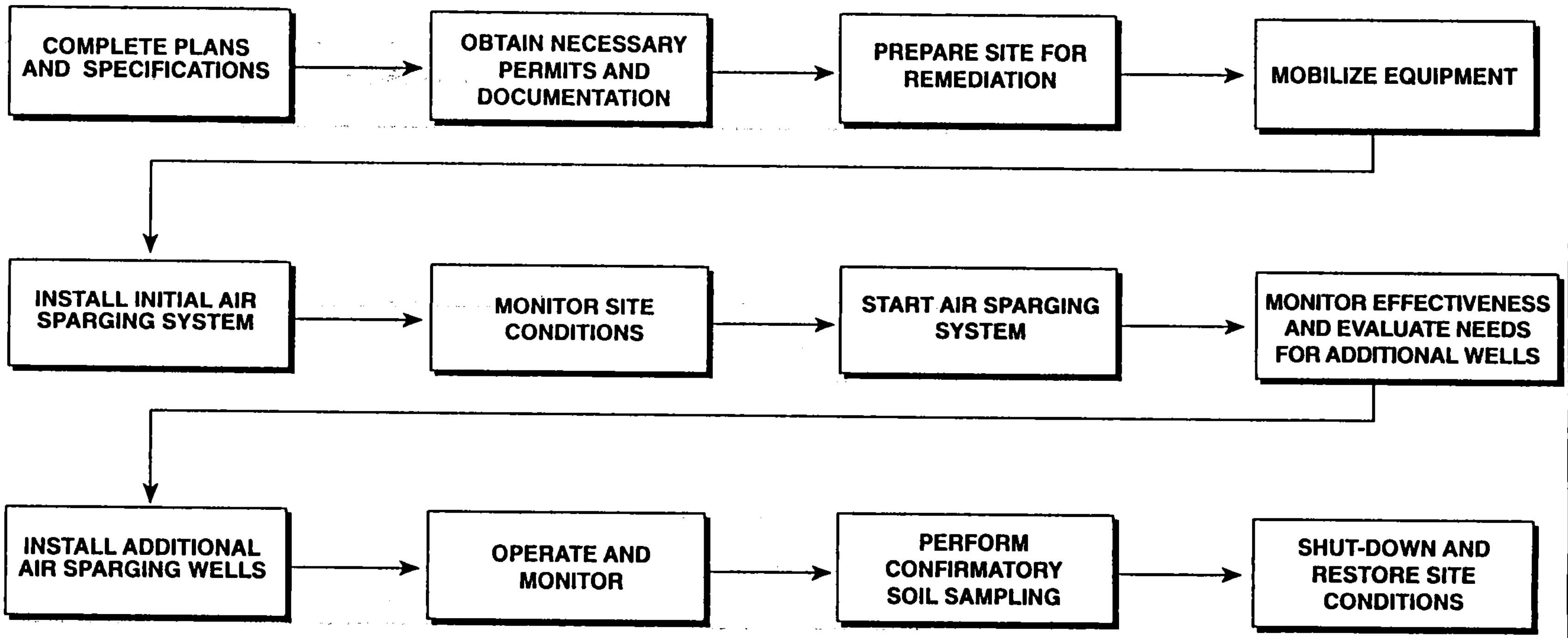


FIGURE 4-8

PROCESS FLOW DIAGRAM FOR ALTERNATIVE RA-4, IN-SITU BIOLOGICAL TREATMENT OF CONTAMINATED SOIL

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

8520-26 940323WEM

horizontal radius of influence of an air injection well at the site as well as the optimum injection pressures and flow rates. Therefore, this alternative proposes that implementation occur in stages. Initially, a limited number of injection points (five in different parts of the site) would be installed and operated. The air compressor would be overdesigned and additional injection points would be added as monitoring of the conditions around the initial wells is evaluated. For cost estimating purposes, it was assumed that wells would be installed to inject air at a depth of 20 ft bls.

Monitoring of the air sparging and bioventing system would consist of: soil gas sampling to evaluate to what extent oxygenation and volatilization is occurring, soil sampling to evaluate removal of contamination and to evaluate microorganism populations and nutrient availability, and groundwater sampling to evaluate dissolved oxygen levels. If necessary, nutrients may be introduced at the site to enhance biological activity. This would be accomplished by a surface percolation system. The surface percolation system would also provide the moisture necessary in the unsaturated soils to support biological activity while oxygen would be supplied to the unsaturated soils from air injection below the water table. Bioremediation above the water table would, in effect, be a bioventing operation, although bioventing does not typically involve the injection of air below the water table.

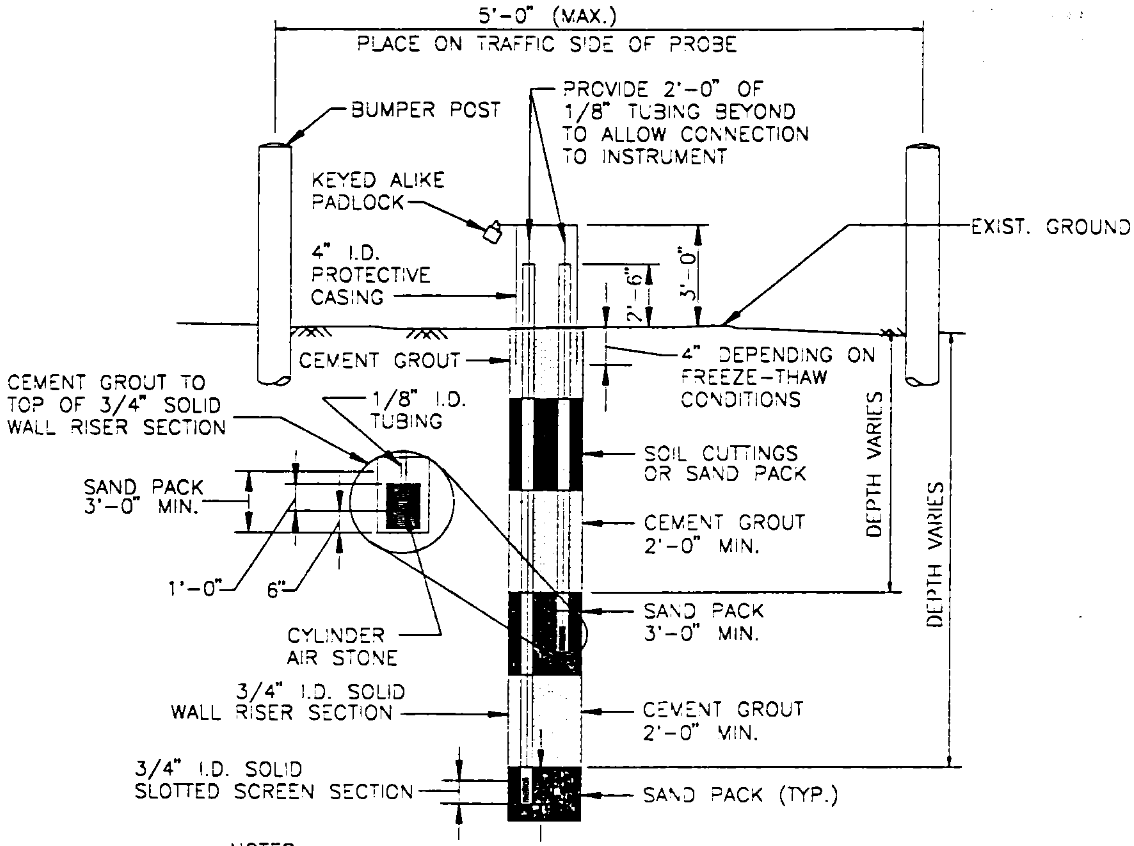
Air sparging and bioventing would continue until the soil action levels are met at the site (50 ppm TRPH), the reduction in contamination appears to be approaching an asymptotic limit, or a final Record of Decision (ROD) for remediation of the whole site including groundwater is signed that supersedes the IROD. For cost estimating purposes, it was assumed that the remediation would continue for 2 years.

Monitoring. Monitoring of the performance of the air sparging system would be performed using up to 10 soil gas monitoring locations and 5 groundwater piezometers. Each monitoring location would be selected based on the location of the air sparging wells.

At a minimum, one soil gas monitoring location would be selected in the immediate vicinity of each air injection well and the remaining soil gas monitoring locations would be at the estimated limits of the effective zone of influence of the air injection wells. Soil gas monitoring locations would consist of two soil gas monitoring probes installed in a soil boring at depths of 2 feet and 5 feet bls. Monitoring probes would be constructed as shown in Figure 4-9.

The five groundwater piezometers would be installed around a single air injection well at different distances from the air injection well. These piezometers would be used to monitor dissolved oxygen content in the groundwater to determine the radius of influence of the air injection well. This information would be used to determine spacing requirements of additional wells.

During initial startup of the air sparging system, soil gas and groundwater oxygen monitoring would be conducted at the monitoring locations to measure the effect of air sparging on oxygen levels in the vadose zone and groundwater and to estimate oxygen utilization by bacteria. The data from this monitoring would be used to evaluate the operating parameters required for the aeration system to provide an adequate oxygen supply to promote biodegradation but to minimize volatilization of VOCs. Air samples would be obtained from up to five monitoring



NOTES:

1. GAS PROBES SHALL BE PROVIDED AT A DEPTH OF 5 FEET OR 1 FOOT ABOVE WATER TABLE, IF WATER TABLE IS LESS THAN 6 FEET BELOW EXISTING GROUND SURFACE.

2. NOT TO SCALE

FIGURE 4-9
TYPICAL GAS MONITORING PROBES

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

locations and analyzed at an offsite laboratory for VOCs, oxygen, carbon dioxide, and nitrogen. For costing purposes, it has been assumed that air samples for laboratory analyses would be obtained weekly for the first month of system operation, monthly for the following 2 months, and quarterly thereafter.

Process monitoring analyses would be performed weekly for the first month, once per month for the following 2 months, and quarterly thereafter. Process monitoring analyses would consist of pH, available nitrogen and phosphate, moisture content, and bacterial populations. The data would be evaluated and process adjustments, such as the addition of mineral nutrient supplements, would be made as needed.

Soil samples would be collected and analyzed to monitor the remedial effects of the system on VOCs, SVOCs, and TRPH. Soil sampling and analysis would be conducted monthly for the initial 3 months of operation and quarterly thereafter. Three soil samples (0 to 2 feet, 2 to 4 feet, and 4 to 6 feet) would be collected using hand augers from each of three locations within the limits of remediation. These samples will be analyzed in an offsite laboratory for VOCs, SVOCs, and TRPH. The data would be evaluated to assess the effectiveness of the remedial action and to identify when the remedial action should be terminated.

Demobilization and Site Restoration. Demobilization and site restoration activities would be similar to those described for the other alternatives. Monitoring wells would not be destroyed by this alternative and, therefore, would not require replacement.

4.4.2 Technical Criteria Assessment

Overall Protection of Human Health and the Environment. This alternative would provide protection of human health and the environment by biologically degrading fuel-related compounds *in-situ*. Although groundwater remediation is not a response objective for this interim remedial action, some destruction of contaminants in groundwater is likely to be achieved by this alternative as well. There is some possibility that volatile compounds will be removed by the air sparging system and escape to the atmosphere; however, as discussed in the description of the alternative, the lack of high concentrations of VOCs and the lack of vapor extraction wells will reduce the likelihood of compounds escaping to the atmosphere through volatilization. Sampling of soil gases will help to evaluate this assumption.

Compliance with ARARs. This alternative is expected to be in compliance with all ARARs except potentially the treatment standards for thermal treatment of petroleum contaminated soils (Chapter 17-775, FAC). These treatment standards specify to treatment to 50 ppm TRPH, 6 ppm PAHs, and 50 ppb VOHs and are a relevant and appropriate requirement. With the current information available, it is not possible to predict if these levels can be achieved by this alternative.

Long-term Effectiveness and Permanence. Reduction of risk at Site 17 would be permanent with this alternative because contaminants would be destroyed by biodegradation. The actual magnitude of residual risk at the site remaining after implementation would have to be evaluated with a risk assessment. The *in-situ* biological treatment of contaminated soils by air sparging and bioventing offers a long-term permanent treatment method; however, because it is an emerging technology, data are not widely available to demonstrate its reliability.

Reduction of Mobility, Toxicity, and Volume. This alternative provides for the aerobic biological treatment of contaminants *in-situ*. Mobility, toxicity, and volume of contamination that would be addressed by this alternative are identical to the other alternatives. It is not possible at this point to determine what residual TRPH level this treatment can achieve in the soils. Compounds that are consumed by microorganism are irreversibly destroyed; however, intermediate byproducts may be formed if biological processes do not completely oxidize contaminants to carbon dioxide and water.

Short-term Effectiveness. Very little risk to the community would be posed by this alternative because it does not involve the excavation and subsequent potential volatilization of contaminants. Some possibility of volatilizing contaminants to the atmosphere does exist as discussed earlier; however, soil gas monitoring would identify this and safety precautions for site workers, such as upgrading to Level C PPE, could be taken. It is not possible to accurately predict the destruction rates of petroleum compounds by this alternative so the duration of the alternative cannot be predicted. Rates are likely to be slower than for *ex-situ* biological treatment; however, it is not expected implementation of the alternative would last for longer than 2 years.

Implementability. This alternative would be easily implemented. It involves only installation of a few wells; construction of air, water, and nutrient supplies; and routine operation and monitoring. The reliability of the technology is unproven. If it is found to be ineffective, additional actions could be easily taken. Approvals could be difficult to obtain because of the unproven nature of the technology.

Costs. Table 4-4 presents the costs estimated for this alternative. Cost calculations are provided in Appendix F. Costs were developed based on the assumption that 5 initial air injection wells would be supplemented with 20 additional wells to achieve complete oxygen delivery to contaminated parts of the site. The actual number of wells required would be determined following initial evaluation of the performance of the first five wells. The total cost for this alternative was found to be $1,129,000. The actual cost could potentially be less than this if fewer wells are required.

Table 4-4
Summary of Cost Estimate for Alternative RA-4: In-situ Biological Treatment of Contaminated Soil

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Capital Costs	Amount
Direct	
1. Site preparation and construction	$82,000
2. Site management	$55,000
3. Remedial activities	$592,000
4. Closure activities	$26,000
Total Direct Cost	$755,000
Indirect	
Health and safety (5 percent of direct cost)	$38,000
Legal, administrative, and permitting (5 percent of direct cost)	$38,000
Engineering (10 percent of direct cost)	$76,000
Services During Construction (10 percent of direct cost)	$76,000
Total Indirect Cost	$227,000
Subtotal, Capital Costs (Direct plus Indirect)	$982,000
Contingency (15 percent of subtotal)	$147,000
Total Cost of Alternative RA-4	$1,129,000

Notes: Prices have been rounded to the nearest $1,000 for this estimate. Totals may differ from those shown in Appendix F due to rounding.

Health and safety cost assumes that site operations would be carried out in modified Level D personal protection equipment (PPE) (i.e., dermal protection).

No present-worth analysis was completed due to brief project duration.

Backup calculations are provided in Appendix F.

5.0 COMPARATIVE ANALYSES OF SOURCE CONTROL REMEDIAL ALTERNATIVES

Comparative analyses of alternatives evaluate the relative performance of each alternative. The analyses use the criteria on which the detailed analyses of alternatives were conducted. The purpose of comparative analysis is to identify the advantages and disadvantages of the alternatives relative to one another to aid in selecting a remedy for source control at Site 17. The comparative analysis is presented in Table 5-1. A summary of the distinguishing features of each alternative is provided in the following paragraphs.

All of the alternatives are expected to be protective of human health and the environment and meet the response objectives. Compliance with ARARs is also expected for each alternative, and each alternative meets the response objectives through treatment that destroys contaminants.

Alternative RA-1 could not be implemented if soils are determined to be hazardous. Alternatives RA-2, RA-3, and RA-4 could be implemented with some modification if soils are determined to be hazardous.

Due to more extensive handling, Alternatives RA-2 and RA-3 would potentially release a greater amount of contaminants onsite through volatilization than RA-1 and RA-4. Alternatives RA-1 and RA-2 would release similar amounts of contamination; however, for Alternative RA-1 more of these releases would occur at the offsite thermal treatment unit location. Likewise Alternatives RA-2 and RA-3 require greater logistic coordination and potentially pose a greater risk to NAS Cecil Field personnel because they involve onsite treatment; however, Alternative RA-1 poses a slightly higher risk to the community from transportation of soils to the offsite treatment facility. Alternative RA-4 presents the lowest overall potential for release of contaminants and risk to the community during implementation.

Alternative RA-4 would take the longest time to complete at an estimated 2 years. Alternative RA-3 would take an estimated 14 months and Alternatives RA-1 and RA-2 could be completed in approximately 3 months.

Alternatives RA-1 and RA-2 are the most expensive and differences between the two are insignificant. Alternative RA-3 is about 15 percent less expensive than Alternatives RA-1 and RA-2. Alternative RA-4 is about 18 percent less expensive than Alternatives RA-1 and RA-2 and could potentially be even less if fewer air injection wells are required.

CFSite17.FFS
MVL.06.94

Table 5-1
Comparative Analysis of Source Control Remedial Alternatives

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Criterion	Alternative RA-1	Alternative RA-2	Alternative RA-3	Alternative RA-4
Overall Protection of Human Health and the Environment				
How risks are eliminated, reduced, or controlled.	Alternative RA-1 would provide an increased level of protection to human health and the environment because risks via direct contact with - contaminants at the site are minimized. Worker health and safety requirements would be maintained.	Analysis is the same as for Alternative RA-1.	Analysis is the same as for Alternative RA-1.	Analysis is the same as or less than that for Alternative RA-1.
Short-term or cross-media effects.	No short-term adverse effects are expected to occur during implementation of this alternative. Care will be taken to prevent cross-media contamination during remedial action. Some volatilization during excavation and handling and some recontamination of backfilled soils by contact with groundwater may occur.	Analysis is the same as for Alternative RA-1 with greater chance of volatilization due to increased handling of soils.	Analysis is the same as for Alternative RA-2.	Analysis is the same as for Alternative RA-1 except that cross-media effects are less likely because no excavation occurs.
Compliance with ARARs				
Chemical-, location-, and action-specific ARARs.	Would comply.	Would comply.	Would comply.	Would comply if 50 ppm TRPH level can be achieved.
Long-term Effectiveness and Permanence				
Magnitude of residual risk	The reduction in risk at Site 17 would be permanent because contaminated soil would be removed from the site. Actual magnitude of residual risk at the site remaining after implementation of the interim remedial action would be addressed in the overall FS for Operable Unit 2. Risk associated with hazardous constituents in soil is reduced through treatment for destruction of these constituents.	Analysis is the same as for Alternative RA-1.	Analysis is the same as for Alternative RA-1.	Analysis is similar to Alternative RA-1 although soils are treated in-situ, not removed, and actual achievable cleanup levels may differ from ex-situ treatment.

See notes at end of table.

000458

Table 5-1 (Continued)
Comparative Analysis of Source Control Remedial Alternatives

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Criterion	Alternative RA-1	Alternative RA-2	Alternative RA-3	Alternative RA-4
Long-term Effectiveness and Permanence (continued)				
Adequacy of controls	Implementation of alternative would provide immediate and long-term source control at Site 17.	Analysis is the same as for Alternative RA-1.	Analysis is the same as for Alternative RA-1.	Analysis is similar to Alternative RA-1 although source control would not be as immediate.
Reliability of controls	Thermal treatment is highly reliable.	Analysis is the same as for Alternative RA-1.	Biological treatment reliable for petroleum wastes; however, treatment time may be longer than expected.	Biological treatment is demonstrated for petroleum wastes; however, air sparging and bioventing is an innovative approach and reliability is uncertain.
Reduction of Mobility, Toxicity, and Volume				
Treatment process and remedy.	Soil would be treated via thermal desorption and after burner to destroy organic contaminants.	Analysis is the same as for Alternative RA-1.	Soil would be treated by microorganisms to destroy organic contaminants.	Analysis is the same as Alternative RA-3.
Amount of hazardous material destroyed or treated.	9,870 yd^3 of contaminated soils containing 5,785 kg of TRPH would be treated for this alternative.	Analysis is the same as for Alternative RA-1.	Analysis is the same as for Alternative RA-1.	Analysis is the same as Alternative RA-1 with the possibility that additional contamination in groundwater or deep soils may also receive treatment.
Reduction of mobility, toxicity, or volume through treatment.	Would achieve significant and permanent reduction in toxicity, mobility, and volume of contaminants in soil.	Analysis is the same as for Alternative RA-1.	Analysis is the same as for Alternative RA-1.	Analysis is the same as Alternative RA-1.
Irreversibility of treatment	Thermal treatment is irreversible.	Analysis is the same as for Alternative RA-1.	Biological treatment is irreversible.	Analysis is the same as for Alternative RA-3
Type and quantity of treatment residuals.	A limited amount of ash would be produced during afterburning of vapors and would be handled by offsite vendor. Decon water would be treated at NAS Cecil Field wastewater treatment plant.	Analysis is the same as for Alternative RA-1.	This alternative produces no ash. Water generated would be drained to the excavation or sent to the wastewater treatment plant. Treatment pad materials would be disposed offsite.	No treatment residuals would be produced if this alternative were implemented.

See notes at end of table.

000458

Table 5-1 (Continued)
Comparative Analysis of Source Control Remedial Alternatives

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Criterion	Alternative RA-1	Alternative RA-2	Alternative RA-3	Alternative RA-4
Short-term Effectiveness				
Protection of community during remedial action.	Dust control would be required during excavation of soil. Fact sheets and posters providing information to the public regarding the remedial action would be distributed. Transportation of wastes offsite poses an increased potential risk.	Analysis is the same as for Alternative RA-1 except no offsite transportation of soils would occur.	Fact sheets and posters providing information to the public regarding remedial action would be distributed.	Analysis is the same as for Alternative RA-3.
Protection of workers during remedial actions.	Workers would be required to follow an approved Health and Safety Plan. Workers within the exclusion zone would be dressed in modified Level D protection and would be on a special medical monitoring program.	Analysis is the same as for Alternative RA-1.	Analysis is the same as for Alternative RA-1.	Analysis is the same as for Alternative RA-1.
Environmental Effects	Minimal effects to surrounding environment expected. Releases to air are expected to have minimal environmental effect.	Analysis is the same as for Alternative RA-1.	Analysis is the same as for Alternative RA-1.	Analysis is the same as for Alternative RA-1.
Time until remedial action objectives are achieved.	Approximately 3 months are necessary to meet the remedial action objectives for Site 17.	Approximately 3 months are necessary to meet the remedial action objectives for Site 17.	Approximately 14 months are necessary to meet the remedial action objectives for Site 17.	Actual time required is undetermined, but assumed to be 2 years for cost purposes.
Implementability				
Ability to construct technology.	No construction necessary.	Mobile thermal treatment units are available and could easily be transported to and assembled onsite.	Materials for construction of a biological treatment area are available and easily constructed onsite.	Materials for well installation and air injection are readily available and easily constructed onsite.
Reliability of technology	Treatment standards for contaminated soil would be met by thermal desorption.	Analysis is the same as for Alternative RA-1.	Treatment standards for contaminated soils would be met by biological mechanisms.	Reliability of technology is undetermined due to its innovative nature.

See notes at end of table.

000458

Table 5-1 (Continued)
Comparative Analysis of Source Control Remedial Alternatives

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Criterion	Alternative RA-1	Alternative RA-2	Alternative RA-3	Alternative RA-4
Implementability (Continued)				
Ease of undertaking additional remedial action, if necessary.	Would provide no impediment to additional remediation. Soils could be reprocessed until treatment standards are met.	Analysis is the same as for Alternative RA-1.	Analysis is the same as for Alternative RA-1.	Analysis is the same as for Alternative RA-1.
Monitoring considerations.	Air monitoring would be conducted as appropriate during excavation. Medical monitoring of workers within the exclusion zone would be required.	Analysis is the same as for Alternative RA-1 with the addition of monitoring during treatment.	Analysis is the same as for Alternative RA-2.	Air monitoring would be conducted as appropriate at system startup.
Coordination with other regulatory agencies.	Coordination with NAS Cecil Field personnel required for duration of remedial activities. Coordination with county, USEPA, FDEP, and city for soil handling necessary.	Analysis is the same as for Alternative RA-1 but coordination in terms of permits is limited to jurisdictions at Cecil Field. USEPA, FDEP, county, and city would be notified of actions being conducted.	Analysis is the same as for Alternative RA-2.	Analysis is the same as for Alternative RA-2.
Availability and capacity of treatment, storage, and disposal services.	Availability of permitted TSD facilities for treatment of contaminated soil would be required at the time of remedial action. Local vendors handle non-hazardous wastes only.	No services required.	No services required.	No services required.
Availability of technologies, equipment, and specialists.	Construction contractors, equipment, and laboratories are available.	Analysis is the same as for Alternative RA-1. Mobile thermal treatment units are available.	Analysis is the same as for Alternative RA-1. Equipment and materials are available but would have to be assembled onsite.	Analysis is the same as for Alternative RA-1.
Ability to obtain approvals from other agencies.	Approval from State and USEPA necessary prior to offsite treatment of contaminated soil.	Approval from State and USEPA necessary prior to onsite treatment of contaminated soil.	Analysis is the same as for Alternative RA-2.	Analysis is the same as for Alternative RA-2.
Cost				
Total present worth, 8-foot depth (including contingency)	$1,376,000	$1,374,000	$1,176,000	$1,129,000

Notes: TSD = treatment, storage, and disposal.
ARAR = Applicable or relevant and appropriate.
NAS = Naval Air Station.
USEPA = U.S. Environmental Protection Agency.
FDEP = Florida Department of Environmental Protection.
ppm = parts per million.
TRPH = total recoverable petroleum hydrocarbon.
kg = kilogram.
yd^3 = cubic yard.

REFERENCES

ABB Environmental Services, Inc. (ABB-ES), 1992, Technical Memorandum for Supplemental Sampling at Operable Units 1, 2, and 7: prepared for the Department of the Navy, Southern Division, Charleston, South Carolina, October 1992.

ABB Environmental Services, Inc. (ABB-ES), 1993, Handbook of Applicable or Relevant and Appropriate Requirements for Navy Sites within the State of Florida: prepared for the Department of the Navy, Southern Division, Charleston, South Carolina, August 1993.

Envirodyne Engineers, 1985, Initial Assessment Study of Naval Air Station Cecil Field, Jacksonville, Florida: prepared for Naval Energy and Environmental Support Activity, Port Hueneme, California, July 1985.

Florida Department of Environmental Protection (FDEP), 1992, Guidelines for Assessment and Remediation of Petroleum Contaminated Soil, May 1992.

Harding Lawson Associates, 1988, Draft Final RCRA Facilities Investigation Report, Naval Air Station Cecil Field, Jacksonville, Florida: prepared for the Department of the Navy, Southern Division, Charleston, South Carolina, March 1988.

U.S. Environmental Protection Agency (USEPA), 1988, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final: EPA/540/G-89/004, Washington, DC, October 1988.

USEPA, 1989, Guidance on Preparing Superfund Decision Documents, Interim Final: EPA/540/G089/007, Washington, DC, November 1989.

USEPA, 1991, Guide to Developing Superfund No Action, Interim Action, and Contingency Remedy RODs, Quick Reference Fact Sheet, Draft: Superfund Publication 93553-02FS-3, Washington, DC, March 1991.

USEPA, 1990, National Oil and Hazardous Substances Pollution and Contingency Plan: 40 Code of Federal Regulations (CFR) Part 300, Washington, DC, March 1990.

USEPA Region III, 1994, Memorandum from R.L. Smith regarding Risk-Based Concentration Table, First Quarter 1994.

APPENDIX A

1993 RI ANALYTICAL RESULTS

Lab Sample Number:	CF17BR4S0				CF17BR4S2				CF17BR5S0				CF17BR5S0M			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR4S0				CF17BR4S2				CF17BR5S0				CF17BR5S0MS			
Collect Date:	11-NOV-93				11-NOV-93				12-NOV-93				12-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW ug/kg																
Chloromethane	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13	13	U	ug/kg	13
Bromomethane	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13	13	U	ug/kg	13
Vinyl chloride	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13	13	U	ug/kg	13
Chloroethane	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13	13	U	ug/kg	13
Methylene chloride	6	U	ug/kg	6	6	U	ug/kg	6	3	J	ug/kg	13	3	J	ug/kg	13
Acetone	12	U	ug/kg	12	12	U	ug/kg	12	160	J	ug/kg	13	280		ug/kg	13
Carbon disulfide	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,1-Dichloroethene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	75		ug/kg	13
1,1-Dichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloroethene (total)	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Chloroform	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
2-Butanone	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13	20		ug/kg	13
1,1,1-Trichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Carbon tetrachloride	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Bromodichloromethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloropropane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
cis-1,3-Dichloropropene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Trichloroethene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	65		ug/kg	13
Dibromochloromethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,1,2-Trichloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Benzene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	68		ug/kg	13
trans-1,3-Dichloropropene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Bromoform	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
4-Methyl-2-pentanone	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13	6	J	ug/kg	13
2-Hexanone	12	U	ug/kg	12	12	U	ug/kg	12	13	U	ug/kg	13	8	J	ug/kg	13
Tetrachloroethene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Toluene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	71		ug/kg	13
1,1,2,2-Tetrachloroethane	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Chlorobenzene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	63		ug/kg	13
Ethylbenzene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Styrene	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Xylenes (total)	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
CLP SEMIVOLATILES 90-SOW ug/kg																
Phenol	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	1700		ug/kg	420
bis(2-Chloroethyl) ether	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
2-Chlorophenol	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	1600		ug/kg	420
1,3-Dichlorobenzene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
1,4-Dichlorobenzene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	850		ug/kg	420
1,2-Dichlorobenzene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
2-Methylphenol	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
2,2-oxybis(1-Chloropropane)	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
4-Methylphenol	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
N-Nitroso-di-n-propylamine	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	1100		ug/kg	420
Hexachloroethane	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Nitrobenzene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Isophorone	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
2-Nitrophenol	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
2,4-Dimethylphenol	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
bis(2-Chloroethoxy) methane	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
2,4-Dichlorophenol	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
1,2,4-Trichlorobenzene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	1000		ug/kg	420

000458

Lab Sample Number:	CF17BR4S0				CF17BR4S2				CF17BR5S0				CF17BR5S0M			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR4S0				CF17BR4S2				CF17BR5S0				CF17BR5S0MS			
Collect Date:	11-NOV-93				11-NOV-93				12-NOV-93				12-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Naphthalene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
4-Chloroaniline	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Hexachlorobutadiene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
4-Chloro-3-methylphenol	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	2100		ug/kg	420
2-Methylnaphthalene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Hexachlorocyclopentadiene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
2,4,6-Trichlorophenol	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
2,4,5-Trichlorophenol	980	U	ug/kg	980	960	U	ug/kg	960	1000	U	ug/kg	1000	1000	U	ug/kg	1000
2-Chloronaphthalene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
2-Nitroaniline	980	U	ug/kg	980	960	U	ug/kg	960	1000	U	ug/kg	1000	1000	U	ug/kg	1000
Dimethylphthalate	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Acenaphthylene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
2,6-Dinitrotoluene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
3-Nitroaniline	980	U	ug/kg	980	960	U	ug/kg	960	1000	U	ug/kg	1000	1000	U	ug/kg	1000
Acenaphthene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	1200		ug/kg	420
2,4-Dinitrophenol	980	U	ug/kg	980	960	U	ug/kg	960	1000	U	ug/kg	1000	1000	U	ug/kg	1000
4-Nitrophenol	980	U	ug/kg	980	960	U	ug/kg	960	1000	U	ug/kg	1000	1800		ug/kg	1000
Dibenzofuran	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
2,4-Dinitrotoluene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	1300		ug/kg	420
Diethylphthalate	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
4-Chlorophenyl-phenylether	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Fluorene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
4-Nitroaniline	980	U	ug/kg	980	960	U	ug/kg	960	1000	U	ug/kg	1000	1000	U	ug/kg	1000
4,6-Dinitro-2-methylphenol	980	U	ug/kg	980	960	U	ug/kg	960	1000	U	ug/kg	1000	1000	U	ug/kg	1000
N-Nitrosodiphenylamine (1)	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
4-Bromophenyl-phenylether	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Hexachlorobenzene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Pentachlorophenol	980	U	ug/kg	980	960	U	ug/kg	960	1000	U	ug/kg	1000	1900		ug/kg	1000
Phenanthrene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Anthracene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Carbazole	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Di-n-butylphthalate	400	U	ug/kg	400	400	U	ug/kg	400	26	J	ug/kg	420	65	J	ug/kg	420
Fluoranthene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Pyrene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	1300		ug/kg	420
Butylbenzylphthalate	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
3,3-Dichlorobenzidine	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Benzo (a) anthracene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Chrysene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
bis(2-Ethylhexyl) phthalate	37	J	ug/kg	400	39	J	ug/kg	400	28	J	ug/kg	420	33	J	ug/kg	420
Di-n-octylphthalate	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Benzo (b) fluoranthene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Benzo (k) fluoranthene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Benzo (a) pyrene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Indeno (1,2,3-cd) pyrene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Dibenz (a,h) anthracene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
Benzo (g,h,i) perylene	400	U	ug/kg	400	400	U	ug/kg	400	420	U	ug/kg	420	420	U	ug/kg	420
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	2.1	U	ug/kg	2.1	2	U	ug/kg	2	2.2	U	ug/kg	2.2	2.2	U	ug/kg	2.2
beta-BHC	2.1	U	ug/kg	2.1	2	U	ug/kg	2	2.2	U	ug/kg	2.2	.62	J	ug/kg	2
delta-BHC	2.1	U	ug/kg	2.1	2	U	ug/kg	2	2.2	U	ug/kg	2.2	2.2	U	ug/kg	2.2
gamma-BHC (Lindane)	2.1	U	ug/kg	2.1	2	U	ug/kg	2	2.2	U	ug/kg	2.2	18		ug/kg	2
Heptachlor	2.1	U	ug/kg	2.1	2	U	ug/kg	2	2.2	U	ug/kg	2.2	17		ug/kg	2
Aldrin	2.1	U	ug/kg	2.1	2	U	[illegible]g	2	2.2	U	ug/kg	2.2	18		ug/kg	2

00458

AR01 - Tre.. Report

Lab Sample Number:	CF17BR4SO				CF17BR4S2				CF17BR5SO				CF17BR5SOM			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR4SO				CF17BR4S2				CF17BR5SO				CF17BR5SOMS			
Collect Date:	11-NOV-93				11-NOV-93				12-NOV-93				12-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Heptachlor epoxide	2.1	U	ug/kg	2.1	2	U	ug/kg	2	2.2	U	ug/kg	2.2	2.2	U	ug/kg	2.2
Endosulfan I	2.1	U	ug/kg	2.1	2	U	ug/kg	2	2.2	U	ug/kg	2.2	2.2	U	ug/kg	2.2
Dieldrin	4	U	ug/kg	4	4	U	ug/kg	4	4.2	U	ug/kg	4.2	36		ug/kg	4
4,4-DDE	4	U	ug/kg	4	4	U	ug/kg	4	4.2	U	ug/kg	4.2	4.2	U	ug/kg	4.2
Endrin	4	U	ug/kg	4	4	U	ug/kg	4	4.2	U	ug/kg	4.2	38		ug/kg	4
Endosulfan II	4	U	ug/kg	4	4	U	ug/kg	4	4.2	U	ug/kg	4.2	4.2	U	ug/kg	4.2
4,4-DDD	4	U	ug/kg	4	4	U	ug/kg	4	4.2	U	ug/kg	4.2	4.2	U	ug/kg	4.2
Endosulfan sulfate	4	U	ug/kg	4	4	U	ug/kg	4	4.2	U	ug/kg	4.2	4.2	U	ug/kg	4.2
4,4-DDT	4	U	ug/kg	4	4	U	ug/kg	4	4.2	U	ug/kg	4.2	32		ug/kg	4
Methoxychlor	21	U	ug/kg	21	.7	U	ug/kg	.7	22	U	ug/kg	22	22	U	ug/kg	22
Endrin ketone	4	U	ug/kg	4	4	U	ug/kg	4	4.2	U	ug/kg	4.2	4.2	U	ug/kg	4.2
Endrin aldehyde	4	U	ug/kg	4	4	U	ug/kg	4	4.2	U	ug/kg	4.2	4.2	U	ug/kg	4.2
alpha-Chlordane	2.1	U	ug/kg	2.1	2	U	ug/kg	2	2.2	U	ug/kg	2.2	2.2	U	ug/kg	2.2
gamma-Chlordane	2.1	U	ug/kg	2.1	2	U	ug/kg	2	2.2	U	ug/kg	2.2	2.2	U	ug/kg	2.2
Toxaphene	210	U	ug/kg	210	200	U	ug/kg	200	220	U	ug/kg	220	220	U	ug/kg	220
Aroclor-1016	40	U	ug/kg	40	40	U	ug/kg	40	42	U	ug/kg	42	42	U	ug/kg	42
Aroclor-1221	82	U	ug/kg	82	80	U	ug/kg	80	85	U	ug/kg	85	85	U	ug/kg	85
Aroclor-1232	40	U	ug/kg	40	40	U	ug/kg	40	42	U	ug/kg	42	42	U	ug/kg	42
Aroclor-1242	40	U	ug/kg	40	40	U	ug/kg	40	42	U	ug/kg	42	42	U	ug/kg	42
Aroclor-1248	40	U	ug/kg	40	40	U	ug/kg	40	42	U	ug/kg	42	42	U	ug/kg	42
Aroclor-1254	40	U	ug/kg	40	40	U	ug/kg	40	42	U	ug/kg	42	42	U	ug/kg	42
Aroclor-1260	40	U	ug/kg	40	40	U	ug/kg	40	42	U	ug/kg	42	42	U	ug/kg	42

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

AR01 - Trend Report

Lab Sample Number:					CF17BR5S0M				CF17BR5S2				CF17BR6S0				CF17BR6S2			
Site					CECIL2				CECIL2				CECIL2				CECIL2			
Locator					CF17BR5S0MSD				CF17BR5S2				CF17BR6S0				CF17BR6S2			
Collect Date:					12-NOV-93				12-NOV-93				11-NOV-93				11-NOV-93			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL			
CLP VOLATILES 90-SOW	ug/kg																			
Chloromethane		13	U	ug/kg	13	12	U	ug/kg	12	12	U	ug/kg	12	1500	U	ug/kg	1500			
Bromomethane		13	U	ug/kg	13	12	U	ug/kg	12	12	U	ug/kg	12	1500	U	ug/kg	1500			
Vinyl chloride		13	U	ug/kg	13	12	U	ug/kg	12	12	U	ug/kg	12	1500	U	ug/kg	1500			
Chloroethane		13	U	ug/kg	13	12	U	ug/kg	12	12	U	ug/kg	12	1500	U	ug/kg	1500			
Methylene chloride		3	J	ug/kg	13	6	U	ug/kg	6	4	J	ug/kg	12	760	U	ug/kg	760			
Acetone		240		ug/kg	13	20	U	ug/kg	20	13	U	ug/kg	13	1700	J	ug/kg				
Carbon disulfide		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
1,1-Dichloroethene		71		ug/kg	13	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
1,1-Dichloroethane		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
1,2-Dichloroethene (total)		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Chloroform		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
1,2-Dichloroethane		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
2-Butanone		13	U	ug/kg	13	12	U	ug/kg	12	12	U	ug/kg	12	1500	U	ug/kg	1500			
1,1,1-Trichloroethane		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Carbon tetrachloride		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Bromodichloromethane		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
1,2-Dichloropropane		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
cis-1,3-Dichloropropene		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Trichloroethene		61		ug/kg	13	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Dibromochloromethane		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
1,1,2-Trichloroethane		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Benzene		65		ug/kg	13	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
trans-1,3-Dichloropropene		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Bromoform		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
4-Methyl-2-pentanone		13	U	ug/kg	13	12	U	ug/kg	12	12	U	ug/kg	12	1500	U	ug/kg	1500			
2-Hexanone		13	U	ug/kg	13	12	U	ug/kg	12	12	U	ug/kg	12	1500	U	ug/kg	1500			
Tetrachloroethene		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Toluene		73		ug/kg	13	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
1,1,2,2-Tetrachloroethane		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Chlorobenzene		62		ug/kg	13	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Ethylbenzene		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Styrene		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
Xylenes (total)		6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6	760	U	ug/kg	760			
CLP SEMIVOLATILES 90-SOW	ug/kg																			
Phenol		1900		ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	36	J	ug/kg	400			
bis(2-Chloroethyl) ether		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400			
2-Chlorophenol		1900		ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400			
1,3-Dichlorobenzene		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400			
1,4-Dichlorobenzene		1000		ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400			
1,2-Dichlorobenzene		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	120	J	ug/kg	400			
2-Methylphenol		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	130	J	ug/kg	400			
2,2-oxybis(1-Chloropropane)		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400			
4-Methylphenol		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	100	J	ug/kg	400			
N-Nitroso-di-n-propylamine		1200		ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400			
Hexachloroethane		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400			
Nitrobenzene		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400			
Isophorone		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400			
2-Nitrophenol		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400			
2,4-Dimethylphenol		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	150	J	ug/kg	400			
bis(2-Chloroethoxy) methane		420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400			
2,4-Dichloroph		420	U	ug/kg	420	390	U	g	390	390	U	ug/kg	390	400	U	ug/kg	00			

Lab Sample Number:	CF17BR5SOM				CF17BR5S2				CF17BR6SO				CF17BR6S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR5SOMSD				CF17BR5S2				CF17BR6SO				CF17BR6S2			
Collect Date:	12-NOV-93				12-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2,4-Trichlorobenzene	1200		ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Naphthalene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
4-Chloroaniline	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Hexachlorobutadiene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
4-Chloro-3-methylphenol	2400		ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
2-Methylnaphthalene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Hexachlorocyclopentadiene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
2,4,6-Trichlorophenol	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
2,4,5-Trichlorophenol	1000	U	ug/kg	1000	950	U	ug/kg	950	950	U	ug/kg	950	980	U	ug/kg	980
2-Chloronaphthalene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
2-Nitroaniline	1000	U	ug/kg	1000	950	U	ug/kg	950	950	U	ug/kg	950	980	U	ug/kg	980
Dimethylphthalate	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Acenaphthylene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
2,6-Dinitrotoluene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
3-Nitroaniline	1000	U	ug/kg	1000	950	U	ug/kg	950	950	U	ug/kg	950	980	U	ug/kg	980
Acenaphthene	1500		ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
2,4-Dinitrophenol	1000	U	ug/kg	1000	950	U	ug/kg	950	950	U	ug/kg	950	980	U	ug/kg	980
4-Nitrophenol	2000		ug/kg	1000	950	U	ug/kg	950	950	U	ug/kg	950	980	U	ug/kg	980
Dibenzofuran	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
2,4-Dinitrotoluene	1500		ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Diethylphthalate	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
4-Chlorophenyl-phenylether	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	28	J	ug/kg	400
Fluorene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
4-Nitroaniline	1000	U	ug/kg	1000	950	U	ug/kg	950	950	U	ug/kg	950	980	U	ug/kg	980
4,6-Dinitro-2-methylphenol	1000	U	ug/kg	1000	950	U	ug/kg	950	950	U	ug/kg	950	980	U	ug/kg	980
N-Nitrosodiphenylamine (1)	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
4-Bromophenyl-phenylether	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Hexachlorobenzene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Pentachlorophenol	2500		ug/kg	1000	950	U	ug/kg	950	950	U	ug/kg	950	980	U	ug/kg	980
Phenanthrene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Anthracene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Carbazole	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Di-n-butylphthalate	100	J	ug/kg	420	36	J	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Fluoranthene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Pyrene	1500		ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Butylbenzylphthalate	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
3,3-Dichlorobenzidine	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Benzo (a) anthracene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Chrysene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
bis(2-Ethylhexyl) phthalate	49	J	ug/kg	420	28	J	ug/kg	390	110	J	ug/kg	390	120	J	ug/kg	400
Di-n-octylphthalate	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Benzo (b) fluoranthene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Benzo (k) fluoranthene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Benzo (a) pyrene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Indeno (1,2,3-cd) pyrene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Dibenz (a,h) anthracene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
Benzo (g,h,i) perylene	420	U	ug/kg	420	390	U	ug/kg	390	390	U	ug/kg	390	400	U	ug/kg	400
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	2.2	U	ug/kg	2.2	2	U	ug/kg	2	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1
beta-BHC	.54	J	ug/kg	2	2	U	ug/kg	2	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1
delta-BHC	2.2	U	ug/kg	2.2	2	U	ug/kg	2	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1
gamma-BHC (Lindane)	18		ug/kg	2	2	U	ug/kg	2	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1
Heptachlor	15		ug/kg	2	2	U	ug/kg	2	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1

AR01 - Trend Report

Lab Sample Number:	CF17BR5SOM				CF17BR5S2				CF17BR6S0				CF17BR6S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR5SOMSD				CF17BR5S2				CF17BR6S0				CF17BR6S2			
Collect Date:	12-NOV-93				12-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Aldrin	19		ug/kg	2	2	U	ug/kg	2	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1
Heptachlor epoxide	2.2	U	ug/kg	2.2	2	U	ug/kg	2	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1
Endosulfan I	2.2	U	ug/kg	2.2	2	U	ug/kg	2	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1
Dieldrin	34		ug/kg	4	3.9	U	ug/kg	3.9	3.9	UJ	ug/kg	3.9	4	U	ug/kg	4
4,4-DDE	4.2	U	ug/kg	4.2	3.9	U	ug/kg	3.9	3.9	UJ	ug/kg	3.9	4	U	ug/kg	4
Endrin	39		ug/kg	4	3.9	U	ug/kg	3.9	3.9	UJ	ug/kg	3.9	4	U	ug/kg	4
Endosulfan II	4.2	U	ug/kg	4.2	3.9	U	ug/kg	3.9	3.9	UJ	ug/kg	3.9	4	U	ug/kg	4
4,4-DDD	4.2	U	ug/kg	4.2	3.9	U	ug/kg	3.9	.7	UJ	ug/kg	.7	.5	U	ug/kg	.5
Endosulfan sulfate	4.2	U	ug/kg	4.2	3.9	U	ug/kg	3.9	3.9	UJ	ug/kg	3.9	4	U	ug/kg	4
4,4-DDT	32		ug/kg	4	3.9	U	ug/kg	3.9	3.9	UJ	ug/kg	3.9	4	U	ug/kg	4
Methoxychlor	22	U	ug/kg	22	20	U	ug/kg	20	20	UJ	ug/kg	20	21	U	ug/kg	21
Endrin ketone	4.2	U	ug/kg	4.2	3.9	U	ug/kg	3.9	3.9	UJ	ug/kg	3.9	4	U	ug/kg	4
Endrin aldehyde	4.2	U	ug/kg	4.2	3.9	U	ug/kg	3.9	3.9	UJ	ug/kg	3.9	4	U	ug/kg	4
alpha-Chlordane	2.2	U	ug/kg	2.2	2	U	ug/kg	2	2	UJ	ug/kg	2	.2	U	ug/kg	.2
gamma-Chlordane	2.2	U	ug/kg	2.2	2	U	ug/kg	2	2	UJ	ug/kg	2	.1	U	ug/kg	.1
Toxaphene	220	U	ug/kg	220	200	U	ug/kg	200	200	UJ	ug/kg	200	210	U	ug/kg	210
Aroclor-1016	42	U	ug/kg	42	39	U	ug/kg	39	39	UJ	ug/kg	39	40	U	ug/kg	40
Aroclor-1221	85	U	ug/kg	85	79	U	ug/kg	79	80	UJ	ug/kg	80	81	U	ug/kg	81
Aroclor-1232	42	U	ug/kg	42	39	U	ug/kg	39	39	UJ	ug/kg	39	40	U	ug/kg	40
Aroclor-1242	42	U	ug/kg	42	39	U	ug/kg	39	39	UJ	ug/kg	39	40	U	ug/kg	40
Aroclor-1248	42	U	ug/kg	42	39	U	ug/kg	39	39	UJ	ug/kg	39	40	U	ug/kg	40
Aroclor-1254	42	U	ug/kg	42	39	U	ug/kg	39	39	UJ	ug/kg	39	40	U	ug/kg	40
Aroclor-1260	42	U	ug/kg	42	39	U	ug/kg	39	39	UJ	ug/kg	39	40	U	ug/kg	40

U = NOT DETECTED J = ESTIMATED VALUE
UJ = °EPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R ULT IS REJECTED AND UNUSABLE

AR01 - Trend Report

Lab Sample Number:	CF17BR7S0				CF17BR7S0M				CF17BR7S0M				CF17BR7S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR7S0				CF17BR7S0MS				CF17BR7S0MSD				CF17BR7S2			
Collect Date:	11-NOV-93				11-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW ug/kg																
Chloromethane	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1500	U	ug/kg	1500
Bromomethane	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1500	U	ug/kg	1500
Vinyl chloride	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1500	U	ug/kg	1500
Chloroethane	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1500	U	ug/kg	1500
Methylene chloride	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
Acetone	1600		ug/kg		2100		ug/kg		2000		ug/kg		1600		ug/kg	
Carbon disulfide	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
1,1-Dichloroethene	790	U	ug/kg	790	7600		ug/kg		8100		ug/kg		760	U	ug/kg	760
1,1-Dichloroethane	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
1,2-Dichloroethene (total)	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
Chloroform	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
1,2-Dichloroethane	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
2-Butanone	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1500	U	ug/kg	1500
1,1,1-Trichloroethane	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
Carbon tetrachloride	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
Bromodichloromethane	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
1,2-Dichloropropane	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
cis-1,3-Dichloropropene	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
Trichloroethene	790	U	ug/kg	790	6800		ug/kg		7100		ug/kg		760	U	ug/kg	760
Dibromochloromethane	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
1,1,2-Trichloroethane	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
Benzene	790	U	ug/kg	790	8800		ug/kg		8900		ug/kg		760	U	ug/kg	760
trans-1,3-Dichloropropene	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
Bromoform	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
4-Methyl-2-pentanone	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1500	U	ug/kg	1500
2-Hexanone	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1600	U	ug/kg	1600	1500	U	ug/kg	1500
Tetrachloroethene	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
Toluene	1400		ug/kg		8600		ug/kg		9200		ug/kg		590	J	ug/kg	15
1,1,2,2-Tetrachloroethane	790	U	ug/kg	790	790	U	ug/kg	790	2900		ug/kg		760	U	ug/kg	760
Chlorobenzene	790	U	ug/kg	790	7400		ug/kg		7600		ug/kg		760	U	ug/kg	760
Ethylbenzene	1400		ug/kg		770	J	ug/kg	16	810		ug/kg	16	530	J	ug/kg	15
Styrene	790	U	ug/kg	790	790	U	ug/kg	790	790	U	ug/kg	790	760	U	ug/kg	760
Xylenes (total)	10000		ug/kg		5700		ug/kg		6100		ug/kg		4200		ug/kg	
CLP SEMIVOLATILES 90-SOW ug/kg																
Phenol	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
bis(2-Chloroethyl) ether	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2-Chlorophenol	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
1,3-Dichlorobenzene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
1,4-Dichlorobenzene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
1,2-Dichlorobenzene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2-Methylphenol	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2,2-oxybis(1-Chloropropane)	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
4-Methylphenol	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
N-Nitroso-di-n-propylamine	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Hexachloroethane	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Nitrobenzene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Isophorone	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2-Nitrophenol	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2,4-Dimethylphenol	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
bis(2-Chloroethoxy) methane	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2,4-Dichlorophenol	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000

000458

AR01 - Trend Report

Lab Sample Number:		CF17BR7S0				CF17BR7S0M				CF17BR7S0M				CF17BR7S2		
Site		CECIL2				CECIL2				CECIL2				CECIL2		
Locator		CF17BR7S0				CF17BR7S0MS				CF17BR7S0MSD				CF17BR7S2		
Collect Date:		11-NOV-93				11-NOV-93				11-NOV-93				11-NOV-93		
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2,4-Trichlorobenzene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Naphthalene	1500		ug/kg	420	-		ug/kg		-		ug/kg		15000		ug/kg	8000
4-Chloroaniline	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Hexachlorobutadiene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
4-Chloro-3-methylphenol	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2-Methylnaphthalene	3000		ug/kg	420	-		ug/kg		-		ug/kg		42000		ug/kg	8000
Hexachlorocyclopentadiene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2,4,6-Trichlorophenol	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2,4,5-Trichlorophenol	1000	U	ug/kg	1000	-		ug/kg		-		ug/kg		20000	U	ug/kg	20000
2-Chloronaphthalene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2-Nitroaniline	1000	U	ug/kg	1000	-		ug/kg		-		ug/kg		20000	U	ug/kg	20000
Dimethylphthalate	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Acenaphthylene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2,6-Dinitrotoluene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
3-Nitroaniline	1000	U	ug/kg	1000	-		ug/kg		-		ug/kg		20000	U	ug/kg	20000
Acenaphthene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
2,4-Dinitrophenol	1000	U	ug/kg	1000	-		ug/kg		-		ug/kg		20000	U	ug/kg	20000
4-Nitrophenol	1000	U	ug/kg	1000	-		ug/kg		-		ug/kg		20000	U	ug/kg	20000
Dibenzofuran	420	U	ug/kg	420	-		ug/kg		-		ug/kg		1600	J	ug/kg	8000
2,4-Dinitrotoluene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Diethylphthalate	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
4-Chlorophenyl-phenylether	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Fluorene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		800	J	ug/kg	8000
4-Nitroaniline	1000	U	ug/kg	1000	-		ug/kg		-		ug/kg		20000	U	ug/kg	20000
4,6-Dinitro-2-methylphenol	1000	U	ug/kg	1000	-		ug/kg		-		ug/kg		20000	U	ug/kg	20000
N-Nitrosodiphenylamine (1)	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
4-Bromophenyl-phenylether	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Hexachlorobenzene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Pentachlorophenol	1000	U	ug/kg	1000	-		ug/kg		-		ug/kg		20000	U	ug/kg	20000
Phenanthrene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Anthracene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Carbazole	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Di-n-butylphthalate	73	J	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Fluoranthene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Pyrene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Butylbenzylphthalate	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
3,3-Dichlorobenzidine	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Benzo (a) anthracene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Chrysene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
bis(2-Ethylhexyl) phthalate	110	J	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Di-n-octylphthalate	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Benzo (b) fluoranthene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Benzo (k) fluoranthene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Benzo (a) pyrene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Indeno (1,2,3-cd) pyrene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Dibenz (a,h) anthracene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
Benzo (g,h,i) perylene	420	U	ug/kg	420	-		ug/kg		-		ug/kg		8000	U	ug/kg	8000
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	2.2	U	ug/kg	2.2	-		ug/kg		-		ug/kg		2.1	UJ	ug/kg	2.1
beta-BHC	2.2	U	ug/kg	2.2	-		ug/kg		-		ug/kg		2.1	UJ	ug/kg	2.1
delta-BHC	2.2	U	ug/kg	2.2	-		ug/kg		-		ug/kg		2.1	UJ	ug/kg	2.1
gamma-BHC (Lindane)	2.2	U	ug/kg	2.2	-		ug/kg		-		ug/kg		2.1	UJ	ug/kg	2.1
Heptachlor	2.2	U	ug/kg	2.2	-		'kg		-		ug/kg		2.1	UJ	ug/kg	2.1

00458

AR01 - Trend Report

Lab Sample Number:	CF17BR7S0				CF17BR7S0M				CF17BR7S0M				CF17BR7S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR7S0				CF17BR7S0MS				CF17BR7S0MSD				CF17BR7S2			
Collect Date:	11-NOV-93				11-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Aldrin	2.2	U	ug/kg	2.2	-		ug/kg		-		ug/kg		2.1	UJ	ug/kg	2.1
Heptachlor epoxide	2.2	U	ug/kg	2.2	-		ug/kg		-		ug/kg		.3	UJ	ug/kg	.3
Endosulfan I	2.2	U	ug/kg	2.2	-		ug/kg		-		ug/kg		2.1	UJ	ug/kg	2.1
Dieldrin	4.2	U	ug/kg	4.2	-		ug/kg		-		ug/kg		4	UJ	ug/kg	4
4,4-DDE	.55	J	ug/kg	4	-		ug/kg		-		ug/kg		4	UJ	ug/kg	4
Endrin	4.2	U	ug/kg	4.2	-		ug/kg		-		ug/kg		4	UJ	ug/kg	4
Endosulfan II	4.2	U	ug/kg	4.2	-		ug/kg		-		ug/kg		4	UJ	ug/kg	4
4,4-DDD	4.2	U	ug/kg	4.2	-		ug/kg		-		ug/kg		4	UJ	ug/kg	4
Endosulfan sulfate	4.2	U	ug/kg	4.2	-		ug/kg		-		ug/kg		4	UJ	ug/kg	4
4,4-DDT	4.2	U	ug/kg	4.2	-		ug/kg		-		ug/kg		4	UJ	ug/kg	4
Methoxychlor	22	U	ug/kg	22	-		ug/kg		-		ug/kg		21	UJ	ug/kg	21
Endrin ketone	4.2	U	ug/kg	4.2	-		ug/kg		-		ug/kg		4	UJ	ug/kg	4
Endrin aldehyde	4.2	U	ug/kg	4.2	-		ug/kg		-		ug/kg		4	UJ	ug/kg	4
alpha-Chlordane	.2	U	ug/kg	.2	-		ug/kg		-		ug/kg		.1	UJ	ug/kg	.1
gamma-Chlordane	.2	U	ug/kg	.2	-		ug/kg		-		ug/kg		2.1	UJ	ug/kg	2.1
Toxaphene	220	U	ug/kg	220	-		ug/kg		-		ug/kg		210	UJ	ug/kg	210
Aroclor-1016	42	U	ug/kg	42	-		ug/kg		-		ug/kg		40	UJ	ug/kg	40
Aroclor-1221	85	U	ug/kg	85	-		ug/kg		-		ug/kg		82	UJ	ug/kg	82
Aroclor-1232	42	U	ug/kg	42	-		ug/kg		-		ug/kg		40	UJ	ug/kg	40
Aroclor-1242	42	U	ug/kg	42	-		ug/kg		-		ug/kg		40	UJ	ug/kg	40
Aroclor-1248	42	U	ug/kg	42	-		ug/kg		-		ug/kg		40	UJ	ug/kg	40
Aroclor-1254	42	U	ug/kg	42	-		ug/kg		-		ug/kg		40	UJ	ug/kg	40
Aroclor-1260	42	U	ug/kg	42	-		ug/kg		-		ug/kg		40	UJ	ug/kg	40

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

AR01 - Trend Report

Lab Sample Number:			CF17BR8S0				CF17BR8S2				CF17BR9S0				CF17BR9S2	
Site			CECIL2				CECIL2				CECIL2				CECIL2	
Locator			CF17BR8S0				CF17BR8S2				CF17BR9S0				CF17BR9S2	
Collect Date:			12-NOV-93				12-NOV-93				11-NOV-93				11-NOV-93	
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW ug/kg																
Chloromethane	2100	U	ug/kg	2100	14	U	ug/kg	14	12	U	ug/kg	12	12	U	ug/kg	12
Bromomethane	2100	U	ug/kg	2100	14	U	ug/kg	14	12	U	ug/kg	12	12	U	ug/kg	12
Vinyl chloride	2100	U	ug/kg	2100	14	U	ug/kg	14	12	U	ug/kg	12	12	U	ug/kg	12
Chloroethane	2100	U	ug/kg	2100	14	U	ug/kg	14	12	U	ug/kg	12	12	U	ug/kg	12
Methylene chloride	1000	U	ug/kg	1000	4	J	ug/kg	14	6	U	ug/kg	6	6	U	ug/kg	6
Acetone	5700	J	ug/kg		180	J	ug/kg	14	12	U	ug/kg	12	15	U	ug/kg	15
Carbon disulfide	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
1,1-Dichloroethene	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
1,1-Dichloroethane	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloroethene (total)	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Chloroform	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloroethane	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
2-Butanone	2100	U	ug/kg	2100	4	J	ug/kg	14	12	U	ug/kg	12	12	U	ug/kg	12
1,1,1-Trichloroethane	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Carbon tetrachloride	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Bromodichloromethane	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloropropane	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
cis-1,3-Dichloropropene	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Trichloroethene	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Dibromochloromethane	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
1,1,2-Trichloroethane	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Benzene	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
trans-1,3-Dichloropropene	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Bromoform	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
4-Methyl-2-pentanone	2100	U	ug/kg	2100	14	U	ug/kg	14	12	U	ug/kg	12	12	U	ug/kg	12
2-Hexanone	2100	U	ug/kg	2100	14	U	ug/kg	14	12	U	ug/kg	12	12	U	ug/kg	12
Tetrachloroethene	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Toluene	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
1,1,2,2-Tetrachloroethane	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Chlorobenzene	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Ethylbenzene	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Styrene	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
Xylenes (total)	1000	U	ug/kg	1000	7	U	ug/kg	7	6	U	ug/kg	6	6	U	ug/kg	6
CLP SEMIVOLATILES 90-SOW ug/kg																
Phenol	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
bis(2-Chloroethyl) ether	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2-Chlorophenol	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
1,3-Dichlorobenzene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
1,4-Dichlorobenzene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
1,2-Dichlorobenzene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2-Methylphenol	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2,2-oxybis(1-Chloropropane)	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
4-Methylphenol	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
N-Nitroso-di-n-propylamine	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Hexachloroethane	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Nitrobenzene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Isophorone	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2-Nitrophenol	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2,4-Dimethylphenol	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
bis(2-Chloroethoxy) methane	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2,4-Dichlorop	550	U	ug/kg	550	480	U	kg	480	380	U	ug/kg	380	400	U	ug/kg	400

00458

Lab Sample Number:	CF17BR8S0				CF17BR8S2				CF17BR9S0				CF17BR9S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR8S0				CF17BR8S2				CF17BR9S0				CF17BR9S2			
Collect Date:	12-NOV-93				12-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2,4-Trichlorobenzene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Naphthalene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
4-Chloroaniline	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Hexachlorobutadiene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
4-Chloro-3-methylphenol	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2-Methylnaphthalene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Hexachlorocyclopentadiene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2,4,6-Trichlorophenol	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2,4,5-Trichlorophenol	1300	U	ug/kg	1300	1200	U	ug/kg	1200	930	U	ug/kg	930	980	U	ug/kg	980
2-Chloronaphthalene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2-Nitroaniline	1300	U	ug/kg	1300	1200	U	ug/kg	1200	930	U	ug/kg	930	980	U	ug/kg	980
Dimethylphthalate	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Acenaphthylene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2,6-Dinitrotoluene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
3-Nitroaniline	1300	U	ug/kg	1300	1200	U	ug/kg	1200	930	U	ug/kg	930	980	U	ug/kg	980
Acenaphthene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2,4-Dinitrophenol	1300	U	ug/kg	1300	1200	U	ug/kg	1200	930	U	ug/kg	930	980	U	ug/kg	980
4-Nitrophenol	1300	U	ug/kg	1300	1200	U	ug/kg	1200	930	U	ug/kg	930	980	U	ug/kg	980
Dibenzofuran	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
2,4-Dinitrotoluene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Diethylphthalate	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
4-Chlorophenyl-phenylether	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Fluorene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
4-Nitroaniline	1300	U	ug/kg	1300	1200	U	ug/kg	1200	930	U	ug/kg	930	980	U	ug/kg	980
4,6-Dinitro-2-methylphenol	1300	U	ug/kg	1300	1200	U	ug/kg	1200	930	U	ug/kg	930	980	U	ug/kg	980
N-Nitrosodiphenylamine (1)	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
4-Bromophenyl-phenylether	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Hexachlorobenzene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Pentachlorophenol	1300	U	ug/kg	1300	1200	U	ug/kg	1200	930	U	ug/kg	930	980	U	ug/kg	980
Phenanthrene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Anthracene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Carbazole	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Di-n-butylphthalate	37	J	ug/kg	550	100	J	ug/kg	480	380	U	ug/kg	380	60	J	ug/kg	400
Fluoranthene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Pyrene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Butylbenzylphthalate	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
3,3-Dichlorobenzidine	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Benzo (a) anthracene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Chrysene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
bis(2-Ethylhexyl) phthalate	96	J	ug/kg	550	63	J	ug/kg	480	83	J	ug/kg	380	25	J	ug/kg	400
Di-n-octylphthalate	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Benzo (b) fluoranthene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Benzo (k) fluoranthene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Benzo (a) pyrene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Indeno (1,2,3-cd) pyrene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Dibenz (a,h) anthracene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
Benzo (g,h,i) perylene	550	U	ug/kg	550	480	U	ug/kg	480	380	U	ug/kg	380	400	U	ug/kg	400
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	2.8	UJ	ug/kg	2.8	2.4	U	ug/kg	2.4	2	U	ug/kg	2	2.1	U	ug/kg	2.1
beta-BHC	2.8	UJ	ug/kg	2.8	2.4	U	ug/kg	2.4	2	U	ug/kg	2	.6	U	ug/kg	.6
delta-BHC	2.8	UJ	ug/kg	2.8	2.4	U	ug/kg	2.4	2	U	ug/kg	2	2.1	U	ug/kg	2.1
gamma-BHC (Lindane)	2.8	UJ	ug/kg	2.8	2.4	U	ug/kg	2.4	2	U	ug/kg	2	2.1	U	ug/kg	2.1
Heptachlor	2.8	UJ	ug/kg	2.8	2.4	U	ug/kg	2.4	2	U	ug/kg	2	2.1	U	ug/kg	2.1

000458

AR01 - Trend Report

Lab Sample Number:	CF17BR8S0				CF17BR8S2				CF17BR9S0				CF17BR9S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR8S0				CF17BR8S2				CF17BR9S0				CF17BR9S2			
Collect Date:	12-NOV-93				12-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Aldrin	2.8	UJ	ug/kg	2.8	2.3	J	ug/kg	2	2	U	ug/kg	2	2.1	U	ug/kg	2.1
Heptachlor epoxide	2.8	UJ	ug/kg	2.8	2.4	U	ug/kg	2.4	2	U	ug/kg	2	2.1	U	ug/kg	2.1
Endosulfan I	2.8	UJ	ug/kg	2.8	2.4	U	ug/kg	2.4	2	U	ug/kg	2	2.1	U	ug/kg	2.1
Dieldrin	5.5	UJ	ug/kg	5.5	4.7	U	ug/kg	4.7	3.8	U	ug/kg	3.8	4	U	ug/kg	4
4,4-DDE	.6	UJ	ug/kg	.6	4.7	U	ug/kg	4.7	.44	J	ug/kg	4	4	U	ug/kg	4
Endrin	5.5	UJ	ug/kg	5.5	4.7	U	ug/kg	4.7	3.8	U	ug/kg	3.8	4	U	ug/kg	4
Endosulfan II	5.5	UJ	ug/kg	5.5	4.7	U	ug/kg	4.7	3.8	U	ug/kg	3.8	4	U	ug/kg	4
4,4-DDD	5.5	UJ	ug/kg	5.5	4.7	U	ug/kg	4.7	3.8	U	ug/kg	3.8	4	U	ug/kg	4
Endosulfan sulfate	5.5	UJ	ug/kg	5.5	4.7	U	ug/kg	4.7	3.8	U	ug/kg	3.8	4	U	ug/kg	4
4,4-DDT	5.5	UJ	ug/kg	5.5	4.7	U	ug/kg	4.7	.3	U	ug/kg	.3	4	U	ug/kg	4
Methoxychlor	1	UJ	ug/kg	1	24	U	ug/kg	24	20	U	ug/kg	20	21	U	ug/kg	21
Endrin ketone	5.5	UJ	ug/kg	5.5	4.7	U	ug/kg	4.7	3.8	U	ug/kg	3.8	4	U	ug/kg	4
Endrin aldehyde	5.5	UJ	ug/kg	5.5	4.7	U	ug/kg	4.7	3.8	U	ug/kg	3.8	4	U	ug/kg	4
alpha-Chlordane	2.8	UJ	ug/kg	2.8	2.4	U	ug/kg	2.4	2	U	ug/kg	2	2.1	U	ug/kg	2.1
gamma-Chlordane	.4	UJ	ug/kg	.4	2.4	U	ug/kg	2.4	2	U	ug/kg	2	2.1	U	ug/kg	2.1
Toxaphene	280	UJ	ug/kg	280	240	U	ug/kg	240	200	U	ug/kg	200	210	U	ug/kg	210
Aroclor-1016	55	UJ	ug/kg	55	47	U	ug/kg	47	38	U	ug/kg	38	40	U	ug/kg	40
Aroclor-1221	110	UJ	ug/kg	110	95	U	ug/kg	95	78	U	ug/kg	78	82	U	ug/kg	82
Aroclor-1232	55	UJ	ug/kg	55	47	U	ug/kg	47	38	U	ug/kg	38	40	U	ug/kg	40
Aroclor-1242	55	UJ	ug/kg	55	47	U	ug/kg	47	38	U	ug/kg	38	40	U	ug/kg	40
Aroclor-1248	55	UJ	ug/kg	55	47	U	ug/kg	47	38	U	ug/kg	38	40	U	ug/kg	40
Aroclor-1254	55	UJ	ug/kg	55	47	U	ug/kg	47	38	U	ug/kg	38	40	U	ug/kg	40
Aroclor-1260	55	UJ	ug/kg	55	47	U	ug/kg	47	38	U	ug/kg	38	40	U	ug/kg	40

U = NOT DETECTED J = ESTIMATED VALUE
UJ REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R SULT IS REJECTED AND UNUSABLE

Lab Sample Number:	CF17BR10S0				CF17BR10S2				CF17BR11S0				CF17BR11S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR10S0				CF17BR10S2				CF17BR11S0				CF17BR11S2			
Collect Date:	11-NOV-93				11-NOV-93				12-NOV-93				12-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW ug/kg																
Chloromethane	12	U	ug/kg	12	1600	U	ug/kg	1600	37	U	ug/kg	37	38	U	ug/kg	38
Bromomethane	12	U	ug/kg	12	1600	U	ug/kg	1600	37	U	ug/kg	37	38	U	ug/kg	38
Vinyl chloride	12	U	ug/kg	12	1600	U	ug/kg	1600	37	U	ug/kg	37	38	U	ug/kg	38
Chloroethane	12	U	ug/kg	12	1600	U	ug/kg	1600	37	U	ug/kg	37	38	U	ug/kg	38
Methylene chloride	3	J	ug/kg	12	790	U	ug/kg	790	12	J	ug/kg	37	12	J	ug/kg	38
Acetone	30	U	ug/kg	30	3900		ug/kg		390	J	ug/kg	37	380	J	ug/kg	38
Carbon disulfide	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
1,1-Dichloroethene	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
1,1-Dichloroethane	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
1,2-Dichloroethene (total)	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
Chloroform	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
1,2-Dichloroethane	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
2-Butanone	12	U	ug/kg	12	1600	U	ug/kg	1600	37	U	ug/kg	37	38	U	ug/kg	38
1,1,1-Trichloroethane	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
Carbon tetrachloride	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
Bromodichloromethane	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
1,2-Dichloropropane	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
cis-1,3-Dichloropropene	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
Trichloroethene	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
Dibromochloromethane	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
1,1,2-Trichloroethane	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
Benzene	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
trans-1,3-Dichloropropene	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
Bromoform	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
4-Methyl-2-pentanone	12	U	ug/kg	12	1600	U	ug/kg	1600	37	U	ug/kg	37	38	U	ug/kg	38
2-Hexanone	12	U	ug/kg	12	1600	U	ug/kg	1600	37	U	ug/kg	37	38	U	ug/kg	38
Tetrachloroethene	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
Toluene	6	U	ug/kg	6	1400		ug/kg		18	U	ug/kg	18	19	U	ug/kg	19
1,1,2,2-Tetrachloroethane	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
Chlorobenzene	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
Ethylbenzene	6	U	ug/kg	6	580	J	ug/kg	16	18	U	ug/kg	18	19	U	ug/kg	19
Styrene	6	U	ug/kg	6	790	U	ug/kg	790	18	U	ug/kg	18	19	U	ug/kg	19
Xylenes (total)	6	U	ug/kg	6	14000		ug/kg		18	U	ug/kg	18	19	U	ug/kg	19
CLP SEMIVOLATILES 90-SOW ug/kg																
Phenol	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
bis(2-Chloroethyl) ether	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2-Chlorophenol	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
1,3-Dichlorobenzene	410	U	ug/kg	410	920	J	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
1,4-Dichlorobenzene	410	U	ug/kg	410	730	J	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
1,2-Dichlorobenzene	68	J	ug/kg	410	18000	J	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2-Methylphenol	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2,2-oxybis(1-Chloropropane)	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
4-Methylphenol	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
N-Nitroso-di-n-propylamine	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Hexachloroethane	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Nitrobenzene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Isophorone	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2-Nitrophenol	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2,4-Dimethylphenol	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
bis(2-Chloroethoxy) methane	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2,4-Dichlorophenol	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510

000458

AR01 - Trend Report

Lab Sample Number:				CF17BR10S0				CF17BR10S2				CF17BR11S0				CF17BR11S2
Site			CECIL2				CECIL2				CECIL2				CECIL2	
Locator			CF17BR10S0				CF17BR10S2				CF17BR11S0				CF17BR11S2	
Collect Date:			11-NOV-93				11-NOV-93				12-NOV-93				12-NOV-93	
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2,4-Trichlorobenzene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Naphthalene	410	U	ug/kg	410	19000	J	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
4-Chloroaniline	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Hexachlorobutadiene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
4-Chloro-3-methylphenol	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2-Methylnaphthalene	410	U	ug/kg	410	47000	J	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Hexachlorocyclopentadiene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2,4,6-Trichlorophenol	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2,4,5-Trichlorophenol	1000	U	ug/kg	1000	20000	UJ	ug/kg	20000	1200	U	ug/kg	1200	1200	U	ug/kg	1200
2-Chloronaphthalene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2-Nitroaniline	1000	U	ug/kg	1000	20000	UJ	ug/kg	20000	1200	U	ug/kg	1200	1200	U	ug/kg	1200
Dimethylphthalate	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Acenaphthylene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2,6-Dinitrotoluene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
3-Nitroaniline	1000	U	ug/kg	1000	20000	UJ	ug/kg	20000	1200	U	ug/kg	1200	1200	U	ug/kg	1200
Acenaphthene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2,4-Dinitrophenol	1000	U	ug/kg	1000	20000	UJ	ug/kg	20000	1200	U	ug/kg	1200	1200	U	ug/kg	1200
4-Nitrophenol	1000	U	ug/kg	1000	20000	UJ	ug/kg	20000	1200	U	ug/kg	1200	1200	U	ug/kg	1200
Dibenzofuran	410	U	ug/kg	410	1900	J	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
2,4-Dinitrotoluene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Diethylphthalate	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
4-Chlorophenyl-phenylether	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Fluorene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
4-Nitroaniline	1000	U	ug/kg	1000	20000	UJ	ug/kg	20000	1200	U	ug/kg	1200	1200	U	ug/kg	1200
4,6-Dinitro-2-methylphenol	1000	U	ug/kg	1000	20000	UJ	ug/kg	20000	1200	U	ug/kg	1200	1200	U	ug/kg	1200
N-Nitrosodiphenylamine (1)	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
4-Bromophenyl-phenylether	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Hexachlorobenzene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Pentachlorophenol	1000	U	ug/kg	1000	20000	UJ	ug/kg	20000	1200	U	ug/kg	1200	1200	U	ug/kg	1200
Phenanthrene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Anthracene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Carbazole	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Di-n-butylphthalate	410	U	ug/kg	410	8400	UJ	ug/kg	8400	75	J	ug/kg	480	91	J	ug/kg	510
Fluoranthene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Pyrene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Butylbenzylphthalate	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
3,3-Dichlorobenzidine	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Benzo (a) anthracene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Chrysene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
bis(2-Ethylhexyl) phthalate	76	J	ug/kg	410	8400	UJ	ug/kg	8400	30	J	ug/kg	480	130	J	ug/kg	510
Di-n-octylphthalate	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Benzo (b) fluoranthene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Benzo (k) fluoranthene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Benzo (a) pyrene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Indeno (1,2,3-cd) pyrene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Dibenz (a,h) anthracene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
Benzo (g,h,i) perylene	410	U	ug/kg	410	8400	UJ	ug/kg	8400	480	U	ug/kg	480	510	U	ug/kg	510
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	2.1	UJ	ug/kg	2.1	2.1	UJ	ug/kg	2.1	.62	J	ug/kg	2	2.6	U	ug/kg	2.6
beta-BHC	2.1	UJ	ug/kg	2.1	2.1	UJ	ug/kg	2.1	2.5	U	ug/kg	2.5	.8	U	ug/kg	.8
delta-BHC	2.1	UJ	ug/kg	2.1	2.1	UJ	ug/kg	2.1	2.5	U	ug/kg	2.5	2.6	U	ug/kg	2.6
gamma-BHC (Lindane)	2.1	UJ	ug/kg	2.1	2.1	UJ	ug/kg	2.1	2.5	U	ug/kg	2.5	2.6	U	ug/kg	2.6
Heptachlor	2.1	UJ	ug/kg	2.1	2.1	UJ	ug/kg	2.1	2.5	U	ug/kg	2.5	2.6	U	ug/kg	2.6

000458

AR01 - Trend Report

Lab Sample Number:	CF17BR10S0				CF17BR10S2				CF17BR11S0				CF17BR11S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR10S0				CF17BR10S2				CF17BR11S0				CF17BR11S2			
Collect Date:	11-NOV-93				11-NOV-93				12-NOV-93				12-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Aldrin	2.1	UJ	ug/kg	2.1	2.1	UJ	ug/kg	2.1	2.5	U	ug/kg	2.5	2.6	U	ug/kg	2.6
Heptachlor epoxide	2.1	UJ	ug/kg	2.1	.4	UJ	ug/kg	.4	2.5	U	ug/kg	2.5	2.6	U	ug/kg	2.6
Endosulfan I	2.1	UJ	ug/kg	2.1	2.1	UJ	ug/kg	2.1	2.5	U	ug/kg	2.5	2.6	U	ug/kg	2.6
Dieldrin	4.1	UJ	ug/kg	4.1	.2	UJ	ug/kg	.2	4.8	U	ug/kg	4.8	5.1	U	ug/kg	5.1
4,4-DDE	4.1	UJ	ug/kg	4.1	4.2	UJ	ug/kg	4.2	4.8	U	ug/kg	4.8	5.1	U	ug/kg	5.1
Endrin	4.1	UJ	ug/kg	4.1	4.2	UJ	ug/kg	4.2	4.8	U	ug/kg	4.8	5.1	U	ug/kg	5.1
Endosulfan II	4.1	UJ	ug/kg	4.1	4.2	UJ	ug/kg	4.2	4.8	U	ug/kg	4.8	5.1	U	ug/kg	5.1
4,4-DDD	4.1	UJ	ug/kg	4.1	4.2	UJ	ug/kg	4.2	4.8	U	ug/kg	4.8	5.1	U	ug/kg	5.1
Endosulfan sulfate	4.1	UJ	ug/kg	4.1	4.2	UJ	ug/kg	4.2	4.8	U	ug/kg	4.8	5.1	U	ug/kg	5.1
4,4-DDT	4.1	UJ	ug/kg	4.1	4.2	UJ	ug/kg	4.2	4.8	U	ug/kg	4.8	5.1	U	ug/kg	5.1
Methoxychlor	2	UJ	ug/kg	2	21	UJ	ug/kg	21	25	U	ug/kg	25	26	U	ug/kg	26
Endrin ketone	4.1	UJ	ug/kg	4.1	4.2	UJ	ug/kg	4.2	4.8	U	ug/kg	4.8	5.1	U	ug/kg	5.1
Endrin aldehyde	4.1	UJ	ug/kg	4.1	4.2	UJ	ug/kg	4.2	4.8	U	ug/kg	4.8	5.1	U	ug/kg	5.1
alpha-Chlordane	.2	UJ	ug/kg	.2	.3	UJ	ug/kg	.3	2.5	U	ug/kg	2.5	2.6	U	ug/kg	2.6
gamma-Chlordane	.3	UJ	ug/kg	.3	2.1	UJ	ug/kg	2.1	.5	U	ug/kg	.5	2.6	U	ug/kg	2.6
Toxaphene	210	UJ	ug/kg	210	210	UJ	ug/kg	210	250	U	ug/kg	250	260	U	ug/kg	260
Aroclor-1016	41	UJ	ug/kg	41	42	UJ	ug/kg	42	48	U	ug/kg	48	51	U	ug/kg	51
Aroclor-1221	83	UJ	ug/kg	83	85	UJ	ug/kg	85	98	U	ug/kg	98	100	U	ug/kg	100
Aroclor-1232	41	UJ	ug/kg	41	42	UJ	ug/kg	42	48	U	ug/kg	48	51	U	ug/kg	51
Aroclor-1242	41	UJ	ug/kg	41	42	UJ	ug/kg	42	48	U	ug/kg	48	51	U	ug/kg	51
Aroclor-1248	41	UJ	ug/kg	41	42	UJ	ug/kg	42	48	U	ug/kg	48	51	U	ug/kg	51
Aroclor-1254	41	UJ	ug/kg	41	42	UJ	ug/kg	42	48	U	ug/kg	48	51	U	ug/kg	51
Aroclor-1260	41	UJ	ug/kg	41	42	UJ	ug/kg	42	48	U	ug/kg	48	51	U	ug/kg	51

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

AR01 - Trend Report

Lab Sample Number:	CF17BR12S0				CF17BR12S2				CF17BR13S0				CF17BR13S0			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR12S0				CF17BR12S2				CF17BR13S0				CF17BR13S0DL			
Collect Date:	11-NOV-93				11-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW ug/kg																
Chloromethane	1500	U	ug/kg	1500	1500	U	ug/kg	1500	12	U	ug/kg	12	1500	U	ug/kg	1500
Bromomethane	1500	U	ug/kg	1500	1500	U	ug/kg	1500	12	U	ug/kg	12	1500	U	ug/kg	1500
Vinyl chloride	1500	U	ug/kg	1500	1500	U	ug/kg	1500	12	U	ug/kg	12	1500	U	ug/kg	1500
Chloroethane	1500	U	ug/kg	1500	1500	U	ug/kg	1500	12	U	ug/kg	12	1500	U	ug/kg	1500
Methylene chloride	760	U	ug/kg	760	350	J	ug/kg	15	6	U	ug/kg	6	760	U	ug/kg	760
Acetone	2000		ug/kg		1200	J	ug/kg		6500	J	ug/kg		7900		ug/kg	
Carbon disulfide	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
1,1-Dichloroethene	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
1,1-Dichloroethane	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
1,2-Dichloroethene (total)	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
Chloroform	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
1,2-Dichloroethane	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
2-Butanone	1500	U	ug/kg	1500	1500	U	ug/kg	1500	12	U	ug/kg	12	1500	U	ug/kg	1500
1,1,1-Trichloroethane	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
Carbon tetrachloride	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
Bromodichloromethane	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
1,2-Dichloropropane	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
cis-1,3-Dichloropropene	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
Trichloroethene	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
Dibromochloromethane	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
1,1,2-Trichloroethane	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
Benzene	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
trans-1,3-Dichloropropene	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
Bromoform	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
4-Methyl-2-pentanone	1500	U	ug/kg	1500	1500	U	ug/kg	1500	12	U	ug/kg	12	1500	U	ug/kg	1500
2-Hexanone	1500	U	ug/kg	1500	1500	U	ug/kg	1500	12	U	ug/kg	12	1500	U	ug/kg	1500
Tetrachloroethene	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
Toluene	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
1,1,2,2-Tetrachloroethane	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
Chlorobenzene	760	U	ug/kg	760	300	J	ug/kg	15	6	U	ug/kg	6	760	U	ug/kg	760
Ethylbenzene	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
Styrene	760	U	ug/kg	760	750	U	ug/kg	750	6	U	ug/kg	6	760	U	ug/kg	760
Xylenes (total)	760	U	ug/kg	760	1100		ug/kg		6	U	ug/kg	6	760	U	ug/kg	760
CLP SEMIVOLATILES 90-SOW ug/kg																
Phenol	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
bis(2-Chloroethyl) ether	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2-Chlorophenol	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
1,3-Dichlorobenzene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
1,4-Dichlorobenzene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
1,2-Dichlorobenzene	400	U	ug/kg	400	1200	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2-Methylphenol	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2,2-oxybis(1-Chloropropane)	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
4-Methylphenol	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
N-Nitroso-di-n-propylamine	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Hexachloroethane	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Nitrobenzene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Isophorone	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2-Nitrophenol	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2,4-Dimethylphenol	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
bis(2-Chloroethoxy) methane	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2,4-Dichloroph	400	U	ug/kg	400	2000	R	kg	2000	400	U	ug/kg	400	-		ug/kg	

000458

Lab Sample Number:	CF17BR12S0				CF17BR12S2				CF17BR13S0				CF17BR13S0			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR12S0				CF17BR12S2				CF17BR13S0				CF17BR13S0DL			
Collect Date:	11-NOV-93				11-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2,4-Trichlorobenzene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Naphthalene	21	J	ug/kg	400	280	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
4-Chloroaniline	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Hexachlorobutadiene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
4-Chloro-3-methylphenol	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2-Methylnaphthalene	44	J	ug/kg	400	740	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Hexachlorocyclopentadiene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2,4,6-Trichlorophenol	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2,4,5-Trichlorophenol	980	U	ug/kg	980	4800	R	ug/kg	4800	980	U	ug/kg	980	-		ug/kg	
2-Chloronaphthalene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2-Nitroaniline	980	U	ug/kg	980	4800	R	ug/kg	4800	980	U	ug/kg	980	-		ug/kg	
Dimethylphthalate	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Acenaphthylene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2,6-Dinitrotoluene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
3-Nitroaniline	980	U	ug/kg	980	4800	R	ug/kg	4800	980	U	ug/kg	980	-		ug/kg	
Acenaphthene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2,4-Dinitrophenol	980	U	ug/kg	980	4800	R	ug/kg	4800	980	U	ug/kg	980	-		ug/kg	
4-Nitrophenol	980	U	ug/kg	980	4800	R	ug/kg	4800	980	U	ug/kg	980	-		ug/kg	
Dibenzofuran	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
2,4-Dinitrotoluene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Diethylphthalate	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
4-Chlorophenyl-phenylether	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Fluorene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
4-Nitroaniline	980	U	ug/kg	980	4800	R	ug/kg	4800	980	U	ug/kg	980	-		ug/kg	
4,6-Dinitro-2-methylphenol	980	U	ug/kg	980	4800	R	ug/kg	4800	980	U	ug/kg	980	-		ug/kg	
N-Nitrosodiphenylamine (1)	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
4-Bromophenyl-phenylether	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Hexachlorobenzene	100	J	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Pentachlorophenol	980	U	ug/kg	980	4800	R	ug/kg	4800	980	U	ug/kg	980	-		ug/kg	
Phenanthrene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Anthracene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Carbazole	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Di-n-butylphthalate	400	U	ug/kg	400	2000	R	ug/kg	2000	64	J	ug/kg	400	-		ug/kg	
Fluoranthene	31	J	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Pyrene	31	J	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Butylbenzylphthalate	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
3,3-Dichlorobenzidine	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Benzo (a) anthracene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Chrysene	25	J	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
bis(2-Ethylhexyl) phthalate	160	J	ug/kg	400	2000	R	ug/kg	2000	21	J	ug/kg	400	-		ug/kg	
Di-n-octylphthalate	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Benzo (b) fluoranthene	37	J	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Benzo (k) fluoranthene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Benzo (a) pyrene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Indeno (1,2,3-cd) pyrene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Dibenz (a,h) anthracene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
Benzo (g,h,i) perylene	400	U	ug/kg	400	2000	R	ug/kg	2000	400	U	ug/kg	400	-		ug/kg	
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	2.1	U	ug/kg	2.1	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1	-		ug/kg	
beta-BHC	2.1	U	ug/kg	2.1	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1	-		ug/kg	
delta-BHC	2.1	U	ug/kg	2.1	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1	-		ug/kg	
gamma-BHC (Lindane)	2.1	U	ug/kg	2.1	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1	-		ug/kg	
Heptachlor	2.1	U	ug/kg	2.1	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1	-		ug/kg	

000458

AR01 - Trend Report

Lab Sample Number:	CF17BR12S0				CF17BR12S2				CF17BR13S0				CF17BR13S0			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR12S0				CF17BR12S2				CF17BR13S0				CF17BR13S0DL			
Collect Date:	11-NOV-93				11-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Aldrin	2.1	U	ug/kg	2.1	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1	-		ug/kg	
Heptachlor epoxide	2.1	U	ug/kg	2.1	.4	UJ	ug/kg	.4	2.1	U	ug/kg	2.1	-		ug/kg	
Endosulfan I	2.1	U	ug/kg	2.1	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1	-		ug/kg	
Dieldrin	4	U	ug/kg	4	4	UJ	ug/kg	4	4	U	ug/kg	4	-		ug/kg	
4,4-DDE	4	U	ug/kg	4	4	UJ	ug/kg	4	4	U	ug/kg	4	-		ug/kg	
Endrin	4	U	ug/kg	4	4	UJ	ug/kg	4	4	U	ug/kg	4	-		ug/kg	
Endosulfan II	.44	J	ug/kg	4	4	UJ	ug/kg	4	4	U	ug/kg	4	-		ug/kg	
4,4-DDD	4	U	ug/kg	4	4	UJ	ug/kg	4	4	U	ug/kg	4	-		ug/kg	
Endosulfan sulfate	4	U	ug/kg	4	4	UJ	ug/kg	4	4	U	ug/kg	4	-		ug/kg	
4,4-DDT	4	U	ug/kg	4	4	UJ	ug/kg	4	4	U	ug/kg	4	-		ug/kg	
Methoxychlor	21	U	ug/kg	21	20	UJ	ug/kg	20	3.4	J	ug/kg	21	-		ug/kg	
Endrin ketone	4	U	ug/kg	4	4	UJ	ug/kg	4	4	U	ug/kg	4	-		ug/kg	
Endrin aldehyde	4	U	ug/kg	4	4	UJ	ug/kg	4	4	U	ug/kg	4	-		ug/kg	
alpha-Chlordane	.3	U	ug/kg	.3	.3	UJ	ug/kg	.3	2.1	U	ug/kg	2.1	-		ug/kg	
gamma-Chlordane	.3	U	ug/kg	.3	2	UJ	ug/kg	2	2.1	U	ug/kg	2.1	-		ug/kg	
Toxaphene	210	U	ug/kg	210	200	UJ	ug/kg	200	210	U	ug/kg	210	-		ug/kg	
Aroclor-1016	40	U	ug/kg	40	40	UJ	ug/kg	40	40	U	ug/kg	40	-		ug/kg	
Aroclor-1221	81	U	ug/kg	81	80	UJ	ug/kg	80	81	U	ug/kg	81	-		ug/kg	
Aroclor-1232	40	U	ug/kg	40	40	UJ	ug/kg	40	40	U	ug/kg	40	-		ug/kg	
Aroclor-1242	40	U	ug/kg	40	40	UJ	ug/kg	40	40	U	ug/kg	40	-		ug/kg	
Aroclor-1248	40	U	ug/kg	40	40	UJ	ug/kg	40	40	U	ug/kg	40	-		ug/kg	
Aroclor-1254	40	U	ug/kg	40	40	UJ	ug/kg	40	40	U	ug/kg	40	-		ug/kg	
Aroclor-1260	40	U	ug/kg	40	40	UJ	ug/kg	40	40	U	ug/kg	40	-		ug/kg	

U = NOT DETECTED J = ESTIMATED VALUE
UJ EPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R 3ULT IS REJECTED AND UNUSABLE

000458

Lab Sample Number:	CF17BR13S2				CF17BR14S0				CF17BR14S0				CF17BR14S0			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR13S2				CF17BR14S0				CF17BR14S0MS				CF17BR14S0MSD			
Collect Date:	11-NOV-93				15-NOV-93				15-NOV-93				15-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW ug/kg																
Chloromethane	60	U	ug/kg	60	13	U	ug/kg	13	13	U	ug/kg	13	13	U	ug/kg	13
Bromomethane	60	U	ug/kg	60	13	U	ug/kg	13	13	U	ug/kg	13	13	U	ug/kg	13
Vinyl chloride	60	U	ug/kg	60	13	U	ug/kg	13	13	U	ug/kg	13	13	U	ug/kg	13
Chloroethane	60	U	ug/kg	60	13	U	ug/kg	13	13	U	ug/kg	13	13	U	ug/kg	13
Methylene chloride	30	U	ug/kg	30	4	J	ug/kg	13	3	J	ug/kg	13	3	J	ug/kg	13
Acetone	1100	J	ug/kg		13	U	ug/kg	13	42		ug/kg	13	31		ug/kg	13
Carbon disulfide	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,1-Dichloroethene	30	U	ug/kg	30	6	U	ug/kg	6	82		ug/kg	13	81		ug/kg	13
1,1-Dichloroethane	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloroethene (total)	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Chloroform	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloroethane	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
2-Butanone	60	U	ug/kg	60	13	U	ug/kg	13	9	J	ug/kg	13	7	J	ug/kg	13
1,1,1-Trichloroethane	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Carbon tetrachloride	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Bromodichloromethane	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,2-Dichloropropane	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
cis-1,3-Dichloropropene	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Trichloroethene	30	U	ug/kg	30	6	U	ug/kg	6	66		ug/kg	13	65		ug/kg	13
Dibromochloromethane	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
1,1,2-Trichloroethane	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Benzene	30	U	ug/kg	30	6	U	ug/kg	6	62		ug/kg	13	62		ug/kg	13
trans-1,3-Dichloropropene	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Bromoform	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
4-Methyl-2-pentanone	60	U	ug/kg	60	13	U	ug/kg	13	13	U	ug/kg	13	13	U	ug/kg	13
2-Hexanone	60	U	ug/kg	60	13	U	ug/kg	13	13	U	ug/kg	13	13	U	ug/kg	13
Tetrachloroethene	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Toluene	30	U	ug/kg	30	6	U	ug/kg	6	68		ug/kg	13	66		ug/kg	13
1,1,2,2-Tetrachloroethane	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Chlorobenzene	30	U	ug/kg	30	6	U	ug/kg	6	65		ug/kg	13	64		ug/kg	13
Ethylbenzene	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Styrene	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
Xylenes (total)	30	U	ug/kg	30	6	U	ug/kg	6	6	U	ug/kg	6	6	U	ug/kg	6
CLP SEMIVOLATILES 90-SOW ug/kg																
Phenol	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
bis(2-Chloroethyl) ether	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2-Chlorophenol	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
1,3-Dichlorobenzene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
1,4-Dichlorobenzene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
1,2-Dichlorobenzene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2-Methylphenol	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2,2-oxybis(1-Chloropropane)	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
4-Methylphenol	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
N-Nitroso-di-n-propylamine	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Hexachloroethane	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Nitrobenzene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Isophorone	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2-Nitrophenol	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2,4-Dimethylphenol	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
bis(2-Chloroethoxy) methane	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2,4-Dichlorophenol	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	

000458

AR01 - Trend Report

Lab Sample Number:	CF17BR13S2				CF17BR14S0				CF17BR14S0				CF17BR14S0			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR13S2				CF17BR14S0				CF17BR14S0MS				CF17BR14S0MSD			
Collect Date:	11-NOV-93				15-NOV-93				15-NOV-93				15-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2,4-Trichlorobenzene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Naphthalene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
4-Chloroaniline	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Hexachlorobutadiene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
4-Chloro-3-methylphenol	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2-Methylnaphthalene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Hexachlorocyclopentadiene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2,4,6-Trichlorophenol	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2,4,5-Trichlorophenol	960	U	ug/kg	960	-		ug/kg		-		ug/kg		-		ug/kg	
2-Chloronaphthalene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2-Nitroaniline	960	U	ug/kg	960	-		ug/kg		-		ug/kg		-		ug/kg	
Dimethylphthalate	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Acenaphthylene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2,6-Dinitrotoluene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
3-Nitroaniline	960	U	ug/kg	960	-		ug/kg		-		ug/kg		-		ug/kg	
Acenaphthene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2,4-Dinitrophenol	960	U	ug/kg	960	-		ug/kg		-		ug/kg		-		ug/kg	
4-Nitrophenol	960	U	ug/kg	960	-		ug/kg		-		ug/kg		-		ug/kg	
Dibenzofuran	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
2,4-Dinitrotoluene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Diethylphthalate	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
4-Chlorophenyl-phenylether	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Fluorene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
4-Nitroaniline	960	U	ug/kg	960	-		ug/kg		-		ug/kg		-		ug/kg	
4,6-Dinitro-2-methylphenol	960	U	ug/kg	960	-		ug/kg		-		ug/kg		-		ug/kg	
N-Nitrosodiphenylamine (1)	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
4-Bromophenyl-phenylether	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Hexachlorobenzene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Pentachlorophenol	960	U	ug/kg	960	-		ug/kg		-		ug/kg		-		ug/kg	
Phenanthrene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Anthracene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Carbazole	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Di-n-butylphthalate	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Fluoranthene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Pyrene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Butylbenzylphthalate	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
3,3-Dichlorobenzidine	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (a) anthracene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Chrysene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
bis(2-Ethylhexyl) phthalate	34	J	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Di-n-octylphthalate	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (b) fluoranthene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (k) fluoranthene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (a) pyrene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Indeno (1,2,3-cd) pyrene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Dibenz (a,h) anthracene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
Benzo (g,h,i) perylene	400	U	ug/kg	400	-		ug/kg		-		ug/kg		-		ug/kg	
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	2	U	ug/kg	2	-		ug/kg		-		ug/kg		-		ug/kg	
beta-BHC	2	U	ug/kg	2	-		ug/kg		-		ug/kg		-		ug/kg	
delta-BHC	2	U	ug/kg	2	-		ug/kg		-		ug/kg		-		ug/kg	
gamma-BHC (Lindane)	2	U	ug/kg	2	-		ug/kg		-		ug/kg		-		ug/kg	
Heptachlor	2	U	ug/kg	2	-		ug/kg		-		ug/kg		-		ug/kg	

AR01 - Trend Report

Lab Sample Number:	CF17BR13S2				CF17BR14S0				CF17BR14S0				CF17BR14S0			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR13S2				CF17BR14S0				CF17BR14S0MS				CF17BR14S0MSD			
Collect Date:	11-NOV-93				15-NOV-93				15-NOV-93				15-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Aldrin	2	U	ug/kg	2	-		ug/kg		-		ug/kg		-		ug/kg	
Heptachlor epoxide	2	U	ug/kg	2	-		ug/kg		-		ug/kg		-		ug/kg	
Endosulfan I	2	U	ug/kg	2	-		ug/kg		-		ug/kg		-		ug/kg	
Dieldrin	4	U	ug/kg	4	-		ug/kg		-		ug/kg		-		ug/kg	
4,4-DDE	4	U	ug/kg	4	-		ug/kg		-		ug/kg		-		ug/kg	
Endrin	4	U	ug/kg	4	-		ug/kg		-		ug/kg		-		ug/kg	
Endosulfan II	4	U	ug/kg	4	-		ug/kg		-		ug/kg		-		ug/kg	
4,4-DDD	4	U	ug/kg	4	-		ug/kg		-		ug/kg		-		ug/kg	
Endosulfan sulfate	4	U	ug/kg	4	-		ug/kg		-		ug/kg		-		ug/kg	
4,4-DDT	4	U	ug/kg	4	-		ug/kg		-		ug/kg		-		ug/kg	
Methoxychlor	1.6	J	ug/kg	20	-		ug/kg		-		ug/kg		-		ug/kg	
Endrin ketone	4	U	ug/kg	4	-		ug/kg		-		ug/kg		-		ug/kg	
Endrin aldehyde	4	U	ug/kg	4	-		ug/kg		-		ug/kg		-		ug/kg	
alpha-Chlordane	2	U	ug/kg	2	-		ug/kg		-		ug/kg		-		ug/kg	
gamma-Chlordane	2	U	ug/kg	2	-		ug/kg		-		ug/kg		-		ug/kg	
Toxaphene	200	U	ug/kg	200	-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1016	40	U	ug/kg	40	-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1221	80	U	ug/kg	80	-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1232	40	U	ug/kg	40	-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1242	40	U	ug/kg	40	-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1248	40	U	ug/kg	40	-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1254	40	U	ug/kg	40	-		ug/kg		-		ug/kg		-		ug/kg	
Aroclor-1260	40	U	ug/kg	40	-		ug/kg		-		ug/kg		-		ug/kg	

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

Lab Sample Number:	CF17BR14S2				CF17BR14S2				CF17BR15S0				CF17BR15S0			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR14S2				CF17BR14S2D				CF17BR15S0				CF17BR15S0D			
Collect Date:	15-NOV-93				15-NOV-93				15-NOV-93				15-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW ug/kg																
Chloromethane	60	U	ug/kg	60	30	U	ug/kg	30	63	U	ug/kg	63	62	U	ug/kg	62
Bromomethane	60	U	ug/kg	60	30	U	ug/kg	30	63	U	ug/kg	63	62	U	ug/kg	62
Vinyl chloride	60	U	ug/kg	60	30	U	ug/kg	30	63	U	ug/kg	63	62	U	ug/kg	62
Chloroethane	60	U	ug/kg	60	30	U	ug/kg	30	63	U	ug/kg	63	62	U	ug/kg	62
Methylene chloride	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Acetone	960	J	ug/kg	60	590	J	ug/kg	30	1000	J	ug/kg		650	J	ug/kg	62
Carbon disulfide	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
1,1-Dichloroethene	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
1,1-Dichloroethane	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
1,2-Dichloroethene (total)	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Chloroform	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
1,2-Dichloroethane	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
2-Butanone	60	U	ug/kg	60	30	U	ug/kg	30	63	U	ug/kg	63	62	U	ug/kg	62
1,1,1-Trichloroethane	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Carbon tetrachloride	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Bromodichloromethane	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
1,2-Dichloropropane	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
cis-1,3-Dichloropropene	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Trichloroethene	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Dibromochloromethane	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
1,1,2-Trichloroethane	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Benzene	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
trans-1,3-Dichloropropene	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Bromoform	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
4-Methyl-2-pentanone	60	U	ug/kg	60	30	U	ug/kg	30	63	U	ug/kg	63	62	U	ug/kg	62
2-Hexanone	60	U	ug/kg	60	30	U	ug/kg	30	63	U	ug/kg	63	62	U	ug/kg	62
Tetrachloroethene	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Toluene	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
1,1,2,2-Tetrachloroethane	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Chlorobenzene	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Ethylbenzene	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Styrene	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
Xylenes (total)	30	U	ug/kg	30	15	U	ug/kg	15	32	U	ug/kg	32	31	U	ug/kg	31
CLP SEMIVOLATILES 90-SOW ug/kg																
Phenol	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
bis(2-Chloroethyl) ether	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2-Chlorophenol	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
1,3-Dichlorobenzene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
1,4-Dichlorobenzene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	20	J	ug/kg	410
1,2-Dichlorobenzene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2-Methylphenol	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2,2-oxybis(1-Chloropropane)	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
4-Methylphenol	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
N-Nitroso-di-n-propylamine	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Hexachloroethane	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Nitrobenzene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Isophorone	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2-Nitrophenol	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2,4-Dimethylphenol	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
bis(2-Chloroethoxy) methane	390	U	ug/kg	390	400	U	[illegible]/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2,4-Dichloroph[illegible]	390	U	ug/kg	390	400	U	[illegible]g	400	420	U	ug/kg	420	410	U	ug/kg	[illegible]10

000458

AR01 - Trend Report

Lab Sample Number:	CF17BR14S2				CF17BR14S2				CF17BR15S0				CF17BR15S0			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR14S2				CF17BR14S2D				CF17BR15S0				CF17BR15S0D			
Collect Date:	15-NOV-93				15-NOV-93				15-NOV-93				15-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2,4-Trichlorobenzene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Naphthalene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
4-Chloroaniline	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Hexachlorobutadiene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
4-Chloro-3-methylphenol	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2-Methylnaphthalene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Hexachlorocyclopentadiene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2,4,6-Trichlorophenol	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2,4,5-Trichlorophenol	950	U	ug/kg	950	960	U	ug/kg	960	1000	U	ug/kg	1000	990	U	ug/kg	990
2-Chloronaphthalene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2-Nitroaniline	950	U	ug/kg	950	960	U	ug/kg	960	1000	U	ug/kg	1000	990	U	ug/kg	990
Dimethylphthalate	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Acenaphthylene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2,6-Dinitrotoluene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
3-Nitroaniline	950	U	ug/kg	950	960	U	ug/kg	960	1000	U	ug/kg	1000	990	U	ug/kg	990
Acenaphthene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2,4-Dinitrophenol	950	U	ug/kg	950	960	U	ug/kg	960	1000	U	ug/kg	1000	990	U	ug/kg	990
4-Nitrophenol	950	U	ug/kg	950	960	U	ug/kg	960	1000	U	ug/kg	1000	990	U	ug/kg	990
Dibenzofuran	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
2,4-Dinitrotoluene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Diethylphthalate	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
4-Chlorophenyl-phenylether	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Fluorene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
4-Nitroaniline	950	U	ug/kg	950	960	U	ug/kg	960	1000	U	ug/kg	1000	990	U	ug/kg	990
4,6-Dinitro-2-methylphenol	950	U	ug/kg	950	960	U	ug/kg	960	1000	U	ug/kg	1000	990	U	ug/kg	990
N-Nitrosodiphenylamine (1)	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
4-Bromophenyl-phenylether	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Hexachlorobenzene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Pentachlorophenol	950	U	ug/kg	950	960	U	ug/kg	960	1000	U	ug/kg	1000	990	U	ug/kg	990
Phenanthrene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Anthracene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Carbazole	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Di-n-butylphthalate	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Fluoranthene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	460	U	ug/kg	460
Pyrene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Butylbenzylphthalate	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
3,3-Dichlorobenzidine	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Benzo (a) anthracene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Chrysene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
bis(2-Ethylhexyl) phthalate	88	J	ug/kg	390	46	J	ug/kg	400	48	J	ug/kg	420	89	J	ug/kg	410
Di-n-octylphthalate	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Benzo (b) fluoranthene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Benzo (k) fluoranthene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Benzo (a) pyrene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Indeno (1,2,3-cd) pyrene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Dibenz (a,h) anthracene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
Benzo (g,h,i) perylene	390	U	ug/kg	390	400	U	ug/kg	400	420	U	ug/kg	420	410	U	ug/kg	410
CLP PESTICIDES/PCBS 90-SOW ug/kg																
alpha-BHC	2	U	ug/kg	2	2	U	ug/kg	2	2.1	UJ	ug/kg	2.1	2.1	U	ug/kg	2.1
beta-BHC	.6	U	ug/kg	.6	.6	U	ug/kg	.6	2.1	UJ	ug/kg	2.1	.6	U	ug/kg	.6
delta-BHC	2	U	ug/kg	2	2	U	ug/kg	2	2.1	UJ	ug/kg	2.1	2.1	U	ug/kg	2.1
gamma-BHC (Lindane)	2	U	ug/kg	2	2	U	ug/kg	2	2.1	UJ	ug/kg	2.1	2.1	U	ug/kg	2.1
Heptachlor	2	U	ug/kg	2	2	U	ug/kg	2	2.1	UJ	ug/kg	2.1	2.1	U	ug/kg	2.1

000458

AR01 - Trend Report

Lab Sample Number:	CF17BR14S2				CF17BR14S2				CF17BR15S0				CF17BR15S0			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR14S2				CF17BR14S2D				CF17BR15S0				CF17BR15S0D			
Collect Date:	15-NOV-93				15-NOV-93				15-NOV-93				15-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Aldrin	.4	U	ug/kg	.4	.5	U	ug/kg	.5	2.1	UJ	ug/kg	2.1	.5	U	ug/kg	.5
Heptachlor epoxide	2	U	ug/kg	2	2	U	ug/kg	2	2.1	UJ	ug/kg	2.1	2.1	U	ug/kg	2.1
Endosulfan I	2	U	ug/kg	2	2	U	ug/kg	2	2.1	UJ	ug/kg	2.1	2.1	U	ug/kg	2.1
Dieldrin	3.9	U	ug/kg	3.9	4	U	ug/kg	4	4.2	UJ	ug/kg	4.2	4.1	U	ug/kg	4.1
4,4-DDE	3.9	U	ug/kg	3.9	4	U	ug/kg	4	4.2	UJ	ug/kg	4.2	4.1	U	ug/kg	4.1
Endrin	3.9	U	ug/kg	3.9	4	U	ug/kg	4	4.2	UJ	ug/kg	4.2	4.1	U	ug/kg	4.1
Endosulfan II	3.9	U	ug/kg	3.9	4	U	ug/kg	4	4.2	UJ	ug/kg	4.2	4.1	U	ug/kg	4.1
4,4-DDD	3.9	U	ug/kg	3.9	4	U	ug/kg	4	4.2	UJ	ug/kg	4.2	4.1	U	ug/kg	4.1
Endosulfan sulfate	3.9	U	ug/kg	3.9	4	U	ug/kg	4	4.2	UJ	ug/kg	4.2	4.1	U	ug/kg	4.1
4,4-DDT	3.9	U	ug/kg	3.9	4	U	ug/kg	4	4.2	UJ	ug/kg	4.2	4.1	U	ug/kg	4.1
Methoxychlor	20	U	ug/kg	20	20	U	ug/kg	20	21	UJ	ug/kg	21	21	U	ug/kg	21
Endrin ketone	3.9	U	ug/kg	3.9	4	U	ug/kg	4	4.2	UJ	ug/kg	4.2	4.1	U	ug/kg	4.1
Endrin aldehyde	3.9	U	ug/kg	3.9	4	U	ug/kg	4	4.2	UJ	ug/kg	4.2	4.1	U	ug/kg	4.1
alpha-Chlordane	2	U	ug/kg	2	2	U	ug/kg	2	2.1	UJ	ug/kg	2.1	2.1	U	ug/kg	2.1
gamma-Chlordane	2	U	ug/kg	2	2	U	ug/kg	2	2.1	UJ	ug/kg	2.1	2.1	U	ug/kg	2.1
Toxaphene	200	U	ug/kg	200	200	U	ug/kg	200	210	UJ	ug/kg	210	210	U	ug/kg	210
Aroclor-1016	39	U	ug/kg	39	40	U	ug/kg	40	42	UJ	ug/kg	42	41	U	ug/kg	41
Aroclor-1221	80	U	ug/kg	80	80	U	ug/kg	80	85	UJ	ug/kg	85	82	U	ug/kg	82
Aroclor-1232	39	U	ug/kg	39	40	U	ug/kg	40	42	UJ	ug/kg	42	41	U	ug/kg	41
Aroclor-1242	39	U	ug/kg	39	40	U	ug/kg	40	42	UJ	ug/kg	42	41	U	ug/kg	41
Aroclor-1248	39	U	ug/kg	39	40	U	ug/kg	40	42	UJ	ug/kg	42	41	U	ug/kg	41
Aroclor-1254	39	U	ug/kg	39	40	U	ug/kg	40	42	UJ	ug/kg	42	41	U	ug/kg	41
Aroclor-1260	39	U	ug/kg	39	40	U	ug/kg	40	42	UJ	ug/kg	42	41	U	ug/kg	41

U = NOT DETECTED J = ESTIMATED VALUE
UJ ᴿEPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R :ULT IS REJECTED AND UNUSABLE

AR01 - Trend Report

Lab Sample Number:	CF17BR15S2				CF17BR15S2			
Site	CECIL2				CECIL2			
Locator	CF17BR15S2				CF17BR15S2D			
Collect Date:	15-NOV-93				15-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW ug/kg								
Chloromethane	1600	U	ug/kg	1600	1600	U	ug/kg	1600
Bromomethane	1600	U	ug/kg	1600	1600	U	ug/kg	1600
Vinyl chloride	1600	U	ug/kg	1600	1600	U	ug/kg	1600
Chloroethane	1600	U	ug/kg	1600	1600	U	ug/kg	1600
Methylene chloride	790	U	ug/kg	790	790	U	ug/kg	790
Acetone	3000	J	ug/kg		2300	J	ug/kg	
Carbon disulfide	790	U	ug/kg	790	790	U	ug/kg	790
1,1-Dichloroethene	790	U	ug/kg	790	790	U	ug/kg	790
1,1-Dichloroethane	790	U	ug/kg	790	790	U	ug/kg	790
1,2-Dichloroethene (total)	790	U	ug/kg	790	790	U	ug/kg	790
Chloroform	790	U	ug/kg	790	790	U	ug/kg	790
1,2-Dichloroethane	790	U	ug/kg	790	790	U	ug/kg	790
2-Butanone	1600	U	ug/kg	1600	1600	U	ug/kg	1600
1,1,1-Trichloroethane	790	U	ug/kg	790	790	U	ug/kg	790
Carbon tetrachloride	790	U	ug/kg	790	790	U	ug/kg	790
Bromodichloromethane	790	U	ug/kg	790	790	U	ug/kg	790
1,2-Dichloropropane	790	U	ug/kg	790	790	U	ug/kg	790
cis-1,3-Dichloropropene	790	U	ug/kg	790	790	U	ug/kg	790
Trichloroethene	790	U	ug/kg	790	790	U	ug/kg	790
Dibromochloromethane	790	U	ug/kg	790	790	U	ug/kg	790
1,1,2-Trichloroethane	790	U	ug/kg	790	790	U	ug/kg	790
Benzene	790	U	ug/kg	790	790	U	ug/kg	790
trans-1,3-Dichloropropene	790	U	ug/kg	790	790	U	ug/kg	790
Bromoform	790	U	ug/kg	790	790	U	ug/kg	790
4-Methyl-2-pentanone	1600	U	ug/kg	1600	1600	U	ug/kg	1600
2-Hexanone	1600	U	ug/kg	1600	1600	U	ug/kg	1600
Tetrachloroethene	790	U	ug/kg	790	790	U	ug/kg	790
Toluene	790	U	ug/kg	790	790	U	ug/kg	790
1,1,2,2-Tetrachloroethane	790	U	ug/kg	790	790	U	ug/kg	790
Chlorobenzene	790	U	ug/kg	790	790	U	ug/kg	790
Ethylbenzene	790	U	ug/kg	790	790	U	ug/kg	790
Styrene	790	U	ug/kg	790	790	U	ug/kg	790
Xylenes (total)	790	U	ug/kg	790	790	U	ug/kg	790
CLP SEMIVOLATILES 90-SOW ug/kg								
Phenol	420	U	ug/kg	420	420	U	ug/kg	420
bis(2-Chloroethyl) ether	420	U	ug/kg	420	420	U	ug/kg	420
2-Chlorophenol	420	U	ug/kg	420	420	U	ug/kg	420
1,3-Dichlorobenzene	420	U	ug/kg	420	420	U	ug/kg	420
1,4-Dichlorobenzene	420	U	ug/kg	420	420	U	ug/kg	420
1,2-Dichlorobenzene	420	U	ug/kg	420	420	U	ug/kg	420
2-Methylphenol	420	U	ug/kg	420	420	U	ug/kg	420
2,2-oxybis(1-Chloropropane)	420	U	ug/kg	420	420	U	ug/kg	420
4-Methylphenol	420	U	ug/kg	420	420	U	ug/kg	420
N-Nitroso-di-n-propylamine	420	U	ug/kg	420	420	U	ug/kg	420
Hexachloroethane	420	U	ug/kg	420	420	U	ug/kg	420
Nitrobenzene	420	U	ug/kg	420	420	U	ug/kg	420
Isophorone	420	U	ug/kg	420	420	U	ug/kg	420
2-Nitrophenol	420	U	ug/kg	420	420	U	ug/kg	420
2,4-Dimethylphenol	420	U	ug/kg	420	420	U	ug/kg	420
bis(2-Chloroethoxy) methane	420	U	ug/kg	420	420	U	ug/kg	420
2,4-Dichlorophenol	420	U	ug/kg	420	420	U	ug/kg	420

Lab Sample Number:	CF17BR15S2				CF17BR15S2			
Site	CECIL2				CECIL2			
Locator	CF17BR15S2				CF17BR15S2D			
Collect Date:	15-NOV-93				15-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
1,2,4-Trichlorobenzene	420	U	ug/kg	420	420	U	ug/kg	420
Naphthalene	420	U	ug/kg	420	420	U	ug/kg	420
4-Chloroaniline	420	U	ug/kg	420	420	U	ug/kg	420
Hexachlorobutadiene	420	U	ug/kg	420	420	U	ug/kg	420
4-Chloro-3-methylphenol	420	U	ug/kg	420	420	U	ug/kg	420
2-Methylnaphthalene	420	U	ug/kg	420	420	U	ug/kg	420
Hexachlorocyclopentadiene	420	U	ug/kg	420	420	U	ug/kg	420
2,4,6-Trichlorophenol	420	U	ug/kg	420	420	U	ug/kg	420
2,4,5-Trichlorophenol	1000	U	ug/kg	1000	1000	U	ug/kg	1000
2-Chloronaphthalene	420	U	ug/kg	420	420	U	ug/kg	420
2-Nitroaniline	1000	U	ug/kg	1000	1000	U	ug/kg	1000
Dimethylphthalate	420	U	ug/kg	420	420	U	ug/kg	420
Acenaphthylene	420	U	ug/kg	420	420	U	ug/kg	420
2,6-Dinitrotoluene	420	U	ug/kg	420	420	U	ug/kg	420
3-Nitroaniline	1000	U	ug/kg	1000	1000	U	ug/kg	1000
Acenaphthene	420	U	ug/kg	420	420	U	ug/kg	420
2,4-Dinitrophenol	1000	U	ug/kg	1000	1000	U	ug/kg	1000
4-Nitrophenol	1000	U	ug/kg	1000	1000	U	ug/kg	1000
Dibenzofuran	420	U	ug/kg	420	420	U	ug/kg	420
2,4-Dinitrotoluene	420	U	ug/kg	420	420	U	ug/kg	420
Diethylphthalate	420	U	ug/kg	420	420	U	ug/kg	420
4-Chlorophenyl-phenylether	420	U	ug/kg	420	420	U	ug/kg	420
Fluorene	420	U	ug/kg	420	420	U	ug/kg	420
4-Nitroaniline	1000	U	ug/kg	1000	1000	U	ug/kg	1000
4,6-Dinitro-2-methylphenol	1000	U	ug/kg	1000	1000	U	ug/kg	1000
N-Nitrosodiphenylamine (1)	420	U	ug/kg	420	420	U	ug/kg	420
4-Bromophenyl-phenylether	420	U	ug/kg	420	420	U	ug/kg	420
Hexachlorobenzene	420	U	ug/kg	420	420	U	ug/kg	420
Pentachlorophenol	1000	U	ug/kg	1000	1000	U	ug/kg	1000
Phenanthrene	420	U	ug/kg	420	420	U	ug/kg	420
Anthracene	420	U	ug/kg	420	420	U	ug/kg	420
Carbazole	420	U	ug/kg	420	420	U	ug/kg	420
Di-n-butylphthalate	420	U	ug/kg	420	420	U	ug/kg	420
Fluoranthene	420	U	ug/kg	420	420	U	ug/kg	420
Pyrene	420	U	ug/kg	420	420	U	ug/kg	420
Butylbenzylphthalate	420	U	ug/kg	420	420	U	ug/kg	420
3,3-Dichlorobenzidine	420	U	ug/kg	420	420	U	ug/kg	420
Benzo (a) anthracene	420	U	ug/kg	420	420	U	ug/kg	420
Chrysene	420	U	ug/kg	420	420	U	ug/kg	420
bis(2-Ethylhexyl) phthalate	150	J	ug/kg	420	270	J	ug/kg	420
Di-n-octylphthalate	420	U	ug/kg	420	420	U	ug/kg	420
Benzo (b) fluoranthene	420	U	ug/kg	420	420	U	ug/kg	420
Benzo (k) fluoranthene	420	U	ug/kg	420	420	U	ug/kg	420
Benzo (a) pyrene	420	U	ug/kg	420	420	U	ug/kg	420
Indeno (1,2,3-cd) pyrene	420	U	ug/kg	420	420	U	ug/kg	420
Dibenz (a,h) anthracene	420	U	ug/kg	420	420	U	ug/kg	420
Benzo (g,h,i) perylene	420	U	ug/kg	420	420	U	ug/kg	420
CLP PESTICIDES/PCBS 90-SOW ug/kg								
alpha-BHC	2.1	U	ug/kg	2.1	2.2	UJ	ug/kg	2.2
beta-BHC	.7	U	ug/kg	.7	.6	UJ	ug/kg	.6
delta-BHC	2.1	U	ug/kg	2.1	2.2	UJ	ug/kg	2.2
gamma-BHC (Lindane)	2.1	U	ug/kg	2.1	2.2	UJ	ug/kg	2.2
Heptachlor	2.1	U	ug/kg	2.1	2.2	UJ	g	2.2

Lab Sample Number:	CF17BR15S2				CF17BR15S2			
Site	CECIL2				CECIL2			
Locator	CF17BR15S2				CF17BR15S2D			
Collect Date:	15-NOV-93				15-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Aldrin	.4	U	ug/kg	.4	.3	UJ	ug/kg	.3
Heptachlor epoxide	2.1	U	ug/kg	2.1	2.2	UJ	ug/kg	2.2
Endosulfan I	2.1	U	ug/kg	2.1	2.2	UJ	ug/kg	2.2
Dieldrin	4.2	U	ug/kg	4.2	4.2	UJ	ug/kg	4.2
4,4-DDE	4.2	U	ug/kg	4.2	4.2	UJ	ug/kg	4.2
Endrin	4.2	U	ug/kg	4.2	4.2	UJ	ug/kg	4.2
Endosulfan II	4.2	U	ug/kg	4.2	4.2	UJ	ug/kg	4.2
4,4-DDD	4.2	U	ug/kg	4.2	4.2	UJ	ug/kg	4.2
Endosulfan sulfate	4.2	U	ug/kg	4.2	4.2	UJ	ug/kg	4.2
4,4-DDT	4.2	U	ug/kg	4.2	4.2	UJ	ug/kg	4.2
Methoxychlor	21	U	ug/kg	21	22	UJ	ug/kg	22
Endrin ketone	4.2	U	ug/kg	4.2	4.2	UJ	ug/kg	4.2
Endrin aldehyde	4.2	U	ug/kg	4.2	4.2	UJ	ug/kg	4.2
alpha-Chlordane	2.1	U	ug/kg	2.1	2.2	UJ	ug/kg	2.2
gamma-Chlordane	2.1	U	ug/kg	2.1	.2	UJ	ug/kg	.2
Toxaphene	210	U	ug/kg	210	220	UJ	ug/kg	220
Aroclor-1016	42	U	ug/kg	42	42	UJ	ug/kg	42
Aroclor-1221	85	U	ug/kg	85	85	UJ	ug/kg	85
Aroclor-1232	42	U	ug/kg	42	42	UJ	ug/kg	42
Aroclor-1242	42	U	ug/kg	42	42	UJ	ug/kg	42
Aroclor-1248	42	U	ug/kg	42	42	UJ	ug/kg	42
Aroclor-1254	42	U	ug/kg	42	42	UJ	ug/kg	42
Aroclor-1260	42	U	ug/kg	42	42	UJ	ug/kg	42

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

AR01 - Trend Report

Lab Sample Number:		CF17BR4S0				CF17BR4S2				CF17BR5S0				CF17BR5S2		
Site		CECIL2				CECIL2				CECIL2				CECIL2		
Locator		CF17BR4S0				CF17BR4S2				CF17BR5S0				CF17BR5S2		
Collect Date:		11-NOV-93				11-NOV-93				12-NOV-93				12-NOV-93		
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE mg/kg																
Aluminum	1320		mg/kg	40	1060		mg/kg	40	1730		mg/kg	40	1350		mg/kg	40
Antimony	2.9	U	mg/kg	12	2.8	U	mg/kg	12	3	U	mg/kg	12	2.8	U	mg/kg	12
Arsenic	.48	UJ	mg/kg	2	.48	UJ	mg/kg	2	.51	UJ	mg/kg	2	.47	UJ	mg/kg	2
Barium	3	U	mg/kg	40	1.6	U	mg/kg	40	2.3	U	mg/kg	40	2.5	U	mg/kg	40
Beryllium	.24	U	mg/kg	1	.24	U	mg/kg	1	.25	U	mg/kg	1	.24	U	mg/kg	1
Cadmium	.72	U	mg/kg	1	.71	U	mg/kg	1	.75	U	mg/kg	1	.71	U	mg/kg	1
Calcium	38000		mg/kg	1000	292		mg/kg	1000	185		mg/kg	1000	107		mg/kg	1000
Chromium	1.2	UJ	mg/kg	2	1.2	UJ	mg/kg	2	1.2	UJ	mg/kg	2	3.2	J	mg/kg	2
Cobalt	.96	U	mg/kg	10	.95	U	mg/kg	10	1	U	mg/kg	10	.95	U	mg/kg	10
Copper	.48	U	mg/kg	5	.47	U	mg/kg	5	1.1	U	mg/kg	5	.47	U	mg/kg	5
Iron	279		mg/kg	20	162		mg/kg	20	198		mg/kg	20	140		mg/kg	20
Lead	2.3		mg/kg	1	.89		mg/kg	1	1.7		mg/kg	1	.74		mg/kg	1
Magnesium	2890		mg/kg	1000	28.9	UJ	mg/kg	1000	33.4	UJ	mg/kg	1000	36.6	UJ	mg/kg	1000
Manganese	6.7	J	mg/kg	3	1	U	mg/kg	3	1.6	U	mg/kg	3	1.1	U	mg/kg	3
Mercury	.12	U	mg/kg	.1	.12	U	mg/kg	.1	.12	U	mg/kg	.1	.11	U	mg/kg	.1
Nickel	.96	U	mg/kg	8	.95	U	mg/kg	8	1.2	U	mg/kg	8	.95	U	mg/kg	8
Potassium	31.9	UJ	mg/kg	1000	23.6	UJ	mg/kg	1000	35.3	UJ	mg/kg	1000	8.8	UJ	mg/kg	1000
Selenium	.48	UJ	mg/kg	1	.48	UJ	mg/kg	1	.51	UJ	mg/kg	1	.47	UJ	mg/kg	1
Silver	.72	U	mg/kg	2	.71	U	mg/kg	2	.75	U	mg/kg	2	.71	U	mg/kg	2
Sodium	198		mg/kg	1000	148		mg/kg	1000	187		mg/kg	1000	146		mg/kg	1000
Thallium	.24		mg/kg	2	.24	U	mg/kg	2	.26	U	mg/kg	2	.24	U	mg/kg	2
Vanadium	1.5		mg/kg	10	.99		mg/kg	10	1.5		mg/kg	10	1	J	mg/kg	10
Zinc	4.8	UJ	mg/kg	4	6.8	UJ	mg/kg	4	11.7	UJ	mg/kg	4	3.3	U	mg/kg	4
Cyanide	.6	U	mg/kg	1	.6	U	mg/kg	1	.63	U	mg/kg	1	.59	U	mg/kg	1

U = NOT DETECTED J = ESTIMATED VALUE
I' REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
ESULT IS REJECTED AND UNUSABLE

AR01 - Trend Report

Lab Sample Number:	CF17BR6S0				CF17BR6S2				CF17BR7S0				CF17BR7S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR6S0				CF17BR6S2				CF17BR7S0				CF17BR7S2			
Collect Date:	11-NOV-93				11-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE mg/kg																
Aluminum	1070		mg/kg	40	987		mg/kg	40	564		mg/kg	40	928		mg/kg	40
Antimony	2.9	U	mg/kg	12	2.9	U	mg/kg	12	3	U	mg/kg	12	2.9	U	mg/kg	12
Arsenic	.47	UJ	mg/kg	2	.48	UJ	mg/kg	2	.5	UJ	mg/kg	2	.49	UJ	mg/kg	2
Barium	2.7	U	mg/kg	40	3.5		mg/kg	40	1.6	J	mg/kg	40	1.6	U	mg/kg	40
Beryllium	.24	U	mg/kg	1	.24	U	mg/kg	1	.25	U	mg/kg	1	.24	U	mg/kg	1
Cadmium	.72	U	mg/kg	1	.72	U	mg/kg	1	.75	U	mg/kg	1	.72	U	mg/kg	1
Calcium	1150		mg/kg	1000	503		mg/kg	1000	1130		mg/kg	1000	653		mg/kg	1000
Chromium	2.6	J	mg/kg	2	2.5	J	mg/kg	2	1.2	UJ	mg/kg	2	6.6	J	mg/kg	2
Cobalt	.96	U	mg/kg	10	.96	U	mg/kg	10	.99	U	mg/kg	10	.95	U	mg/kg	10
Copper	3.8	U	mg/kg	5	4.6		mg/kg	5	1.2	U	mg/kg	5	.77	U	mg/kg	5
Iron	180		mg/kg	20	167		mg/kg	20	116		mg/kg	20	120		mg/kg	20
Lead	4.7		mg/kg	1	2.5		mg/kg	1	9.9		mg/kg	1	20.1		mg/kg	1
Magnesium	60.2	UJ	mg/kg	1000	89		mg/kg	1000	38.5	UJ	mg/kg	1000	42.2	UJ	mg/kg	1000
Manganese	2.4	U	mg/kg	3	5.6	J	mg/kg	3	12.6	J	mg/kg	3	29.5	J	mg/kg	3
Mercury	.11	U	mg/kg	.1	.13	U	mg/kg	.1	.12	U	mg/kg	.1	.12	U	mg/kg	.1
Nickel	1.1	U	mg/kg	8	3.5	U	mg/kg	8	.99	U	mg/kg	8	.95	U	mg/kg	8
Potassium	6.4	UJ	mg/kg	1000	14.2	UJ	mg/kg	1000	9.2	UJ	mg/kg	1000	19.1	UJ	mg/kg	1000
Selenium	.47	UJ	mg/kg	1	.48	UJ	mg/kg	1	.5	UJ	mg/kg	1	.49	UJ	mg/kg	1
Silver	.72	U	mg/kg	2	.72	U	mg/kg	2	.75	U	mg/kg	2	.72	U	mg/kg	2
Sodium	131		mg/kg	1000	158		mg/kg	1000	160		mg/kg	1000	153		mg/kg	1000
Thallium	.23	U	mg/kg	2	.24	U	mg/kg	2	.25		mg/kg	2	.27		mg/kg	2
Vanadium	.85	J	mg/kg	10	.74		mg/kg	10	1		mg/kg	10	.95		mg/kg	10
Zinc	4.9	UJ	mg/kg	4	20.7	J	mg/kg	4	9.5	UJ	mg/kg	4	6.4	UJ	mg/kg	4
Cyanide	1.4		mg/kg	1	.6	U	mg/kg	1	.63	U	mg/kg	1	.6	U	mg/kg	1

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

AR01 - Trend Report

Lab Sample Number:	CF17BR8S0				CF17BR8S2				CF17BR9S0				CF17BR9S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR8S0				CF17BR8S2				CF17BR9S0				CF17BR9S2			
Collect Date:	12-NOV-93				12-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE mg/kg																
Aluminum	5050		mg/kg	40	4430		mg/kg	40	1440		mg/kg	40	1170		mg/kg	40
Antimony	4.1	U	mg/kg	12	3.4	U	mg/kg	12	2.9	U	mg/kg	12	3	U	mg/kg	12
Arsenic	.68	UJ	mg/kg	2	.57	UJ	mg/kg	2	.48	UJ	mg/kg	2	.49	UJ	mg/kg	2
Barium	9.5		mg/kg	40	5.4		mg/kg	40	2.4	U	mg/kg	40	.93	U	mg/kg	40
Beryllium	.34	U	mg/kg	1	.29	U	mg/kg	1	.24	U	mg/kg	1	.25	U	mg/kg	1
Cadmium	1	U	mg/kg	1	.86	U	mg/kg	1	.72	U	mg/kg	1	.74	U	mg/kg	1
Calcium	1430		mg/kg	1000	247		mg/kg	1000	7530		mg/kg	1000	741		mg/kg	1000
Chromium	4.8	J	mg/kg	2	3.5	J	mg/kg	2	3.1	J	mg/kg	2	5	J	mg/kg	2
Cobalt	1.4	U	mg/kg	10	1.1	U	mg/kg	10	.95	U	mg/kg	10	.99	U	mg/kg	10
Copper	1.9	U	mg/kg	5	2	U	mg/kg	5	.54	U	mg/kg	5	.5	U	mg/kg	5
Iron	699		mg/kg	20	208		mg/kg	20	198		mg/kg	20	92.6		mg/kg	20
Lead	10.2		mg/kg	1	2.3		mg/kg	1	2	J	mg/kg	1	.91	J	mg/kg	1
Magnesium	134		mg/kg	1000	55.2	UJ	mg/kg	1000	75.2		mg/kg	1000	26.6	UJ	mg/kg	1000
Manganese	8.1	J	mg/kg	3	2	U	mg/kg	3	4.1	J	mg/kg	3	1.2	U	mg/kg	3
Mercury	.17	U	mg/kg	.1	.14	U	mg/kg	.1	.11	U	mg/kg	.1	.12	U	mg/kg	.1
Nickel	1.4	U	mg/kg	8	1.1	U	mg/kg	8	.95	U	mg/kg	8	2.6	U	mg/kg	8
Potassium	44.2	UJ	mg/kg	1000	14.2	UJ	mg/kg	1000	11.9	UJ	mg/kg	1000	5.7	UJ	mg/kg	1000
Selenium	.68	UJ	mg/kg	1	.57	UJ	mg/kg	1	.48	UJ	mg/kg	1	.49	UJ	mg/kg	1
Silver	1	U	mg/kg	2	.86	U	mg/kg	2	.72	U	mg/kg	2	.74	U	mg/kg	2
Sodium	252		mg/kg	1000	220		mg/kg	1000	149		mg/kg	1000	170		mg/kg	1000
Thallium	.34	U	mg/kg	2	.28	U	mg/kg	2	.24	U	mg/kg	2	.25	U	mg/kg	2
Vanadium	3.5		mg/kg	10	1.6		mg/kg	10	1.6		mg/kg	10	.62		mg/kg	10
Zinc	12.2	UJ	mg/kg	4	6.6		mg/kg	4	8.6	UJ	mg/kg	4	3.7	UJ	mg/kg	4
Cyanide	.83	U	mg/kg	1	.72	U	mg/kg	1	.58	U	mg/kg	1	.61	U	mg/kg	1

000458

U = NOT DETECTED J = ESTIMATED VALUE
U REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
ESULT IS REJECTED AND UNUSABLE

Lab Sample Number:	CF17BR10S0				CF17BR10S2				CF17BR11S0				CF17BR11S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR10S0				CF17BR10S2				CF17BR11S0				CF17BR11S2			
Collect Date:	11-NOV-93				11-NOV-93				12-NOV-93				12-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE mg/kg																
Aluminum	776		mg/kg	40	806		mg/kg	40	2460		mg/kg	40	5140		mg/kg	40
Antimony	2.9	U	mg/kg	12	3.1	U	mg/kg	12	5.9	U	mg/kg	12	6.3	U	mg/kg	12
Arsenic	.5	UJ	mg/kg	2	.5	UJ	mg/kg	2	.6	UJ	mg/kg	2	.61	UJ	mg/kg	2
Barium	4.6		mg/kg	40	3.4	U	mg/kg	40	9.7		mg/kg	40	7.5		mg/kg	40
Beryllium	.25	U	mg/kg	1	.26	U	mg/kg	1	.88	U	mg/kg	1	.94	U	mg/kg	1
Cadmium	.74	U	mg/kg	1	.77	U	mg/kg	1	1.2	U	mg/kg	1	1.3	U	mg/kg	1
Calcium	924		mg/kg	1000	318		mg/kg	1000	2100		mg/kg	1000	752		mg/kg	1000
Chromium	8.5	J	mg/kg	2	7.2	J	mg/kg	2	4.1	U	mg/kg	2	6.5	U	mg/kg	2
Cobalt	.98	U	mg/kg	10	1	U	mg/kg	10	3.8	U	mg/kg	10	4.1	U	mg/kg	10
Copper	1.9	J	mg/kg	5	.98	U	mg/kg	5	2.3	U	mg/kg	5	1.2	U	mg/kg	5
Iron	169		mg/kg	20	128		mg/kg	20	750		mg/kg	20	451		mg/kg	20
Lead	9.3		mg/kg	1	20.9		mg/kg	1	15.2		mg/kg	1	4.3	J	mg/kg	1
Magnesium	23.2	UJ	mg/kg	1000	22.9	UJ	mg/kg	1000	112	U	mg/kg	1000	125	U	mg/kg	1000
Manganese	112	J	mg/kg	3	77.9	J	mg/kg	3	4.7	U	mg/kg	3	3	U	mg/kg	3
Mercury	.12	U	mg/kg	.1	.12	U	mg/kg	.1	.16	U	mg/kg	.1	.15	U	mg/kg	.1
Nickel	.98	U	mg/kg	8	1	U	mg/kg	8	3.2	U	mg/kg	8	3.4	U	mg/kg	8
Potassium	5.6	UJ	mg/kg	1000	11.7	UJ	mg/kg	1000	60.7	U	mg/kg	1000	69.1	U	mg/kg	1000
Selenium	.5	UJ	mg/kg	1	.5	UJ	mg/kg	1	.6	UJ	mg/kg	1	.61	UJ	mg/kg	1
Silver	.74	U	mg/kg	2	.77	U	mg/kg	2	.59	U	mg/kg	2	.63	U	mg/kg	2
Sodium	155		mg/kg	1000	169		mg/kg	1000	202		mg/kg	1000	233		mg/kg	1000
Thallium	.25	U	mg/kg	2	.25	U	mg/kg	2	.42	J	mg/kg	2	.43	J	mg/kg	2
Vanadium	.49	U	mg/kg	10	.82		mg/kg	10	2.4	U	mg/kg	10	2.7	U	mg/kg	10
Zinc	11.3	U	mg/kg	4	7.4	UJ	mg/kg	4	1.4	J	mg/kg	4	2.3	J	mg/kg	4
Cyanide	.62	U	mg/kg	1	.63	U	mg/kg	1	.73	U	mg/kg	1	.77	U	mg/kg	1

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

AR01 - Trend Report

Lab Sample Number:	CF17BR12S0				CF17BR12S2				CF17BR13S0				CF17BR13S2			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17BR12S0				CF17BR12S2				CF17BR13S0				CF17BR13S2			
Collect Date:	11-NOV-93				11-NOV-93				11-NOV-93				11-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE mg/kg																
Aluminum	820		mg/kg	40	876		mg/kg	40	994		mg/kg	40	2270		mg/kg	40
Antimony	2.9	U	mg/kg	12	2.9	U	mg/kg	12	2.9	U	mg/kg	12	2.8	U	mg/kg	12
Arsenic	.49	UJ	mg/kg	2	.49	UJ	mg/kg	2	.49	UJ	mg/kg	2	.47	UJ	mg/kg	2
Barium	2.8	U	mg/kg	40	1.7	U	mg/kg	40	1.1	U	mg/kg	40	1.7	U	mg/kg	40
Beryllium	.24	U	mg/kg	1	.24	U	mg/kg	1	.24	U	mg/kg	1	.24	U	mg/kg	1
Cadmium	.73	U	mg/kg	1	.73	U	mg/kg	1	.73	U	mg/kg	1	.71	U	mg/kg	1
Calcium	53000		mg/kg	1000	414		mg/kg	1000	222		mg/kg	1000	121		mg/kg	1000
Chromium	1.2	UJ	mg/kg	2	5	J	mg/kg	2	2.7	J	mg/kg	2	3.9	J	mg/kg	2
Cobalt	.97	U	mg/kg	10	.98	U	mg/kg	10	.97	U	mg/kg	10	.95	U	mg/kg	10
Copper	.96	U	mg/kg	5	.59	U	mg/kg	5	.49	U	mg/kg	5	.47	U	mg/kg	5
Iron	177		mg/kg	20	128		mg/kg	20	176		mg/kg	20	207		mg/kg	20
Lead	7.1		mg/kg	1	7.4		mg/kg	1	2.3		mg/kg	1	2		mg/kg	1
Magnesium	345		mg/kg	1000	25.1	UJ	mg/kg	1000	12.2	UJ	mg/kg	1000	32.4	UJ	mg/kg	1000
Manganese	4.9	J	mg/kg	3	14.9	J	mg/kg	3	.56	U	mg/kg	3	1.1	U	mg/kg	3
Mercury	.11	U	mg/kg	.1	.13	U	mg/kg	.1	.12	U	mg/kg	.1	.11	U	mg/kg	.1
Nickel	.97	U	mg/kg	8	.98	U	mg/kg	8	.97	U	mg/kg	8	.95	U	mg/kg	8
Potassium	21.7	UJ	mg/kg	1000	5.7	UJ	mg/kg	1000	5.6	UJ	mg/kg	1000	11.7	UJ	mg/kg	1000
Selenium	.49	UJ	mg/kg	1	.49	UJ	mg/kg	1	.49	UJ	mg/kg	1	.47	UJ	mg/kg	1
Silver	.73	U	mg/kg	2	.73	U	mg/kg	2	.73	U	mg/kg	2	.71	U	mg/kg	2
Sodium	146		mg/kg	1000	161		mg/kg	1000	164		mg/kg	1000	167		mg/kg	1000
Thallium	.24	U	mg/kg	2	.24	U	mg/kg	2	.24	U	mg/kg	2	.24	U	mg/kg	2
Vanadium	1.3		mg/kg	10	.49	U	mg/kg	10	.54	J	mg/kg	10	1.4		mg/kg	10
Zinc	5	UJ	mg/kg	4	7	UJ	mg/kg	4	3.6	UJ	mg/kg	4	5.5	UJ	mg/kg	4
Cyanide	.6	U	mg/kg	1	.6	U	mg/kg	1	.6	U	mg/kg	1	.6	U	mg/kg	1

U = NOT DETECTED J = ESTIMATED VALUE
U' REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
/ :SULT IS REJECTED AND UNUSABLE

Lab Sample Number:		CF17BR14S0				CF17BR14S2				CF17BR14S2				CF17BR15S0			
Site		CECIL2				CECIL2				CECIL2				CECIL2			
Locator		CF17BR14S0				CF17BR14S2				CF17BR14S2D				CF17BR15S0			
Collect Date:		15-NOV-93				15-NOV-93				15-NOV-93				15-NOV-93			
		VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE	mg/kg																
Aluminum		2210		mg/kg	40	2640		mg/kg	40	3170		mg/kg	40	1500		mg/kg	40
Antimony		5.1	U	mg/kg	12	4.7	U	mg/kg	12	4.7	U	mg/kg	12	5.1	U	mg/kg	12
Arsenic		.5	UJ	mg/kg	2	.47	UJ	mg/kg	2	.49	UJ	mg/kg	2	.5	UJ	mg/kg	2
Barium		4.6	U	mg/kg	40	3.2	U	mg/kg	40	3.7	U	mg/kg	40	2.2	U	mg/kg	40
Beryllium		.76	U	mg/kg	1	.7	U	mg/kg	1	.71	U	mg/kg	1	.76	U	mg/kg	1
Cadmium		1	U	mg/kg	1	.93	U	mg/kg	1	.95	U	mg/kg	1	1	U	mg/kg	1
Calcium		1620		mg/kg	1000	266		mg/kg	1000	309		mg/kg	1000	291		mg/kg	1000
Chromium		3.6	U	mg/kg	2	4.9	U	mg/kg	2	6.6		mg/kg	2	3.2	U	mg/kg	2
Cobalt		3.3	U	mg/kg	10	3	U	mg/kg	10	3.1	U	mg/kg	10	3.3	U	mg/kg	10
Copper		1.6	U	mg/kg	5	.88	U	mg/kg	5	1.1	U	mg/kg	5	.89	U	mg/kg	5
Iron		380		mg/kg	20	194		mg/kg	20	243		mg/kg	20	223		mg/kg	20
Lead		3	J	mg/kg	1	2	J	mg/kg	1	1.9	J	mg/kg	1	1.6	J	mg/kg	1
Magnesium		85.3	U	mg/kg	1000	60.4	U	mg/kg	1000	78.4	U	mg/kg	1000	54.2	U	mg/kg	1000
Manganese		2.8	U	mg/kg	3	1.5	U	mg/kg	3	1.7	U	mg/kg	3	1.5	U	mg/kg	3
Mercury		.12	U	mg/kg	.1	.12	U	mg/kg	.1	.11	U	mg/kg	.1	.13	U	mg/kg	.1
Nickel		2.8	U	mg/kg	8	2.6	U	mg/kg	8	2.7	U	mg/kg	8	2.8	U	mg/kg	8
Potassium		49.3	U	mg/kg	1000	42.4	U	mg/kg	1000	51.1	U	mg/kg	1000	34.2	U	mg/kg	1000
Selenium		.5	UJ	mg/kg	1	.47	UJ	mg/kg	1	.49	UJ	mg/kg	1	.5	UJ	mg/kg	1
Silver		.51	U	mg/kg	2	.47	U	mg/kg	2	.47	U	mg/kg	2	.51	U	mg/kg	2
Sodium		210		mg/kg	1000	152		mg/kg	1000	152		mg/kg	1000	165		mg/kg	1000
Thallium		.28	J	mg/kg	2	.23		mg/kg	2	.25	U	mg/kg	2	.25	U	mg/kg	2
Vanadium		1.9	U	mg/kg	10	1	U	mg/kg	10	1.5	U	mg/kg	10	1.4	U	mg/kg	10
Zinc		6.8	J	mg/kg	4	.7	UJ	mg/kg	4	.71	UJ	mg/kg	4	.76	UJ	mg/kg	4
Cyanide		.63	U	mg/kg	1	.59	U	mg/kg	1	.6	U	mg/kg	1	.62	U	mg/kg	1

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

AR01 - Trend Report

Lab Sample Number:	CF17BR15S0				CF17BR15S2				CF17BR15S2			
Site	CECIL2				CECIL2				CECIL2			
Locator	CF17BR15S0D				CF17BR15S2				CF17BR15S2D			
Collect Date:	15-NOV-93				15-NOV-93				15-NOV-93			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE mg/kg												
Aluminum	1820		mg/kg	40	2190		mg/kg	40	2260		mg/kg	40
Antimony	4.9	U	mg/kg	12	5	U	mg/kg	12	5.1	U	mg/kg	12
Arsenic	.49	UJ	mg/kg	2	.5	UJ	mg/kg	2	.49	UJ	mg/kg	2
Barium	2.3	U	mg/kg	40	2.3	U	mg/kg	40	2.5	U	mg/kg	40
Beryllium	.74	U	mg/kg	1	.75	U	mg/kg	1	.77	U	mg/kg	1
Cadmium	.98	U	mg/kg	1	1	U	mg/kg	1	1	U	mg/kg	1
Calcium	223		mg/kg	1000	183	U	mg/kg	1000	204		mg/kg	1000
Chromium	3.7	U	mg/kg	2	3	U	mg/kg	2	3.9	U	mg/kg	2
Cobalt	3.2	U	mg/kg	10	3.2	U	mg/kg	10	3.3	U	mg/kg	10
Copper	.75	U	mg/kg	5	.8	U	mg/kg	5	.75	U	mg/kg	5
Iron	242		mg/kg	20	240		mg/kg	20	315		mg/kg	20
Lead	1.6	J	mg/kg	1	1.6	J	mg/kg	1	2.3	J	mg/kg	1
Magnesium	56.3	U	mg/kg	1000	58.5	U	mg/kg	1000	75.3	U	mg/kg	1000
Manganese	1.5	U	mg/kg	3	1.3	U	mg/kg	3	1.6	U	mg/kg	3
Mercury	.12	U	mg/kg	.1	.12	U	mg/kg	.1	.12	U	mg/kg	.1
Nickel	2.7	U	mg/kg	8	2.7	U	mg/kg	8	2.8	U	mg/kg	8
Potassium	37.6	U	mg/kg	1000	39.9	U	mg/kg	1000	63.2	U	mg/kg	1000
Selenium	.49	UJ	mg/kg	1	.5	UJ	mg/kg	1	.49	UJ	mg/kg	1
Silver	.49	U	mg/kg	2	.5	U	mg/kg	2	.51	U	mg/kg	2
Sodium	222		mg/kg	1000	285		mg/kg	1000	326		mg/kg	1000
Thallium	.24	U	mg/kg	2	.25	U	mg/kg	2	.25	U	mg/kg	2
Vanadium	1.2	U	mg/kg	10	1.2	U	mg/kg	10	1.2	U	mg/kg	10
Zinc	.74	UJ	mg/kg	4	.75	UJ	mg/kg	4	1.7	J	mg/kg	4
Cyanide	.61	U	mg/kg	1	.63	U	mg/kg	1	.62	U	mg/kg	1

U = NOT DETECTED J = ESTIMATED VALUE
U' REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
ESULT IS REJECTED AND UNUSABLE

Alias	Name	Value	Qualifier
CF 17 BR10 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	540	
CF 17 BR10 S0	Solids, Total (TS) SOLID MATRIX	80	
CF 17 BR10 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	9200	
CF 17 BR10 S2	Solids, Total (TS) SOLID MATRIX	82	
CF 17 BR11 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U
CF 17 BR11 S0	Solids, Total (TS) SOLID MATRIX	23	
CF 17 BR11 S2	Petro.Hydrocarbons, Total Rec. (TRPH) by	1	U
CF 17 BR11 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U
CF 17 BR11 S2	Solids, Total (TS) SOLID MATRIX	66	
CF 17 BR12 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	1500	
CF 17 BR12 S0	Solids, Total (TS) SOLID MATRIX	80	
CF 17 BR12 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	910	
CF 17 BR12 S2	Solids, Total (TS) SOLID MATRIX	83	
CF 17 BR13 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	15	
CF 17 BR13 S0	Solids, Total (TS) SOLID MATRIX	83	
CF 17 BR13 S2	Carbon (TOC) in Solids	4100	
CF 17 BR13 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U
CF 17 BR13 S2	Solids, Total (TS) SOLID MATRIX	84	
CF 17 BR14 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U
CF 17 BR14 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	716	
C 17 BR14 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	746	
C 17 BR14 S0	Solids, Total (TS) SOLID MATRIX	78	
CF 17 BR14 S2	Petro.Hydrocarbons, Total Rec. (TRPH)	12	U
CF 17 BR14 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U
CF 17 BR14 S2	Solids, Total (TS) SOLID MATRIX	80	
CF 17 BR14 S2	Solids, Total (TS) SOLID MATRIX	82	
CF 17 BR15 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U
CF 17 BR15 S0	Solids, Total (TS) SOLID MATRIX	79	
CF 17 BR15 S0	Solids, Total (TS) SOLID MATRIX	79	
CF 17 BR15 S0	Petro.Hydrocarbons, Total Rec. (TRPH)	13	U
CF 17 BR15 S2	Petro.Hydrocarbons, Total Rec. (TRPH) by	1	U
CF 17 BR15 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U
CF 17 BR15 S2	Solids, Total (TS) SOLID MATRIX	78	
CF 17 BR15 S2	Solids, Total (TS) SOLID MATRIX	79	
CF 17 BR15 S2	Petro.Hydrocarbons, Total Rec. (TRPH)	13	U
CF 17 BR4 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	680	
CF 17 BR4 S0	Solids, Total (TS) SOLID MATRIX	84	
CF 17 BR4 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	110	
CF 17 BR4 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	1287	
CF 17 BR4 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	1367	
CF 17 BR4 S2	Solids, Total (TS) SOLID MATRIX	84	
CF 17 BR5 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U
CF 17 BR5 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	730	
CF 17 BR5 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	740	
CF 17 BR5 S0	Solids, Total (TS) SOLID MATRIX	80	
CF 17 BR5 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U

Alias	Name	Value	Qualifier
CF 17 BR5 S2	Solids, Total (TS) SOLID MATRIX	81	
CF 17 BR6 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	810	
CF 17 BR6 S0	Solids, Total (TS) SOLID MATRIX	84	
CF 17 BR6 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	330	
CF 17 BR6 S2	Solids, Total (TS) SOLID MATRIX	83	
CF 17 BR7 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	480	
CF 17 BR7 S0	Solids, Total (TS) SOLID MATRIX	79	
CF 17 BR7 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	5900	
CF 17 BR7 S2	Solids, Total (TS) SOLID MATRIX	81	
CF 17 BR7 S2R	Petro.Hydrocarbons, Total Rec. (TRPH) by	1	U
CF 17 BR8 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U
CF 17 BR8 S0	Solids, Total (TS) SOLID MATRIX	63	
CF 17 BR8 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U
CF 17 BR8 S2	Solids, Total (TS) SOLID MATRIX	61	
CF 17 BR9 S0	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	44	
CF 17 BR9 S0	Solids, Total (TS) SOLID MATRIX	83	
CF 17 BR9 S2	Petro.Hydrocarbons, Total Rec.(TPHIR-Sol	10	U
CF 17 BR9 S2	Solids, Total (TS) SOLID MATRIX	83	

VALIDATED DATA -- VOLATILES

Lab Sample Number:	J2134				J2143				J2624				J2622			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17MW24S				CF17MW25SI				CF17MW26I				CF17MW27D			
Collect Date:	11-JAN-94				11-JAN-94				12-JAN-94				12-JAN-94			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW																
Chloromethane	1200	U	ug/l	1200	2	U	ug/l	2	2	U	ug/l	2	2	U	ug/l	2
Bromomethane	1200	U	ug/l	1200	2	U	ug/l	2	2	U	ug/l	2	2	U	ug/l	2
Vinyl chloride	1200	U	ug/l	1200	2	U	ug/l	2	2	U	ug/l	2	2	U	ug/l	2
Chloroethane	1200	U	ug/l	1200	2	U	ug/l	2	2	U	ug/l	2	2	U	ug/l	2
Methylene chloride	20000	J	ug/l		2		ug/l	2	1	U	ug/l	1	1	U	ug/l	1
Acetone	1700	U	ug/l	1700	2	U	ug/l	2	2	U	ug/l	2	2	U	ug/l	2
Carbon disulfide	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
1,1-Dichloroethene	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
1,1-Dichloroethane	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
1,2-Dichloroethene (total)	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Chloroform	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
1,2-Dichloroethane	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
2-Butanone	1200	U	ug/l	1200	2	U	ug/l	2	2	U	ug/l	2	2	U	ug/l	2
1,1,1-Trichloroethane	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Carbon tetrachloride	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Bromodichloromethane	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
1,2-Dichloropropane	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
cis-1,3-Dichloropropene	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Trichloroethene	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Dibromochloromethane	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
1,1,2-Trichloroethane	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Benzene	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
trans-1,3-Dichloropropene	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Bromoform	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
4-Methyl-2-pentanone	1200	U	ug/l	1200	2	U	ug/l	2	2	U	ug/l	2	2	U	ug/l	2
2-Hexanone	1200	U	ug/l	1200	2	R	ug/l	2	2	U	ug/l	2	2	U	ug/l	2
Tetrachloroethene	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Toluene	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
1,1,2,2-Tetrachloroethane	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Chlorobenzene	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Ethylbenzene	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Styrene	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Xylenes (total)	620	U	ug/l	620	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1

U = NON DETECTED J = ESTIMATED
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

06/15/94 NAS CECIL FIELD -- OPERABLE UNIT 2 -- SITE 17 15:28:43
VALIDATED DATA -- VOLATILES

Lab Sample Number:	J2623			
Site	CECIL2			
Locator	CF17MW28DD			
Collect Date:	12-JAN-94			
	VALUE	QUAL	UNITS	DL
CLP VOLATILES 90-SOW				
Chloromethane	2	U	ug/l	2
Bromomethane	2	U	ug/l	2
Vinyl chloride	2	U	ug/l	2
Chloroethane	2	U	ug/l	2
Methylene chloride	1	U	ug/l	1
Acetone	6	U	ug/l	6
Carbon disulfide	1	U	ug/l	1
1,1-Dichloroethene	1	U	ug/l	1
1,1-Dichloroethane	1	U	ug/l	1
1,2-Dichloroethene (total)	1	U	ug/l	1
Chloroform	1	U	ug/l	1
1,2-Dichloroethane	1	U	ug/l	1
2-Butanone	2	U	ug/l	2
1,1,1-Trichloroethane	1	U	ug/l	1
Carbon tetrachloride	1	U	ug/l	1
Bromodichloromethane	1	U	ug/l	1
1,2-Dichloropropane	1	U	ug/l	1
cis-1,3-Dichloropropene	1	U	ug/l	1
Trichloroethene	1	U	ug/l	1
Dibromochloromethane	1	U	ug/l	1
1,1,2-Trichloroethane	1	U	ug/l	1
Benzene	1	U	ug/l	1
trans-1,3-Dichloropropene	1	U	ug/l	1
Bromoform	1	U	ug/l	1
4-Methyl-2-pentanone	2	U	ug/l	2
2-Hexanone	2	U	ug/l	2
Tetrachloroethene	1	U	ug/l	1
Toluene	1	U	ug/l	1
1,1,2,2-Tetrachloroethane	1	U	ug/l	1
Chlorobenzene	1	U	ug/l	1
Ethylbenzene	1	U	ug/l	1
Styrene	1	U	ug/l	1
Xylenes (total)	1	U	ug/l	1

U = NON DETECTED J = ESTIMATED
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

06/15/94 NAS CECIL FIELD -- OPERABLE UNIT 2 -- SITE 17 15:30:07
VALIDATED DATA -- SEMIVOLATILES

Lab Sample Number:	J2134				J2143				J2624				J2622			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17MW24S				CF17MW25SI				CF17MW26I				CF17MW27D			
Collect Date:	11-JAN-94				11-JAN-94				12-JAN-94				12-JAN-94			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW																
Phenol	4900	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
bis(2-Chloroethyl) ether	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Chlorophenol	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,3-Dichlorobenzene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,4-Dichlorobenzene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,2-Dichlorobenzene	50	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Methylphenol	15000	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,2-oxybis(1-Chloropropane)	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Methylphenol	14000	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
N-Nitroso-di-n-propylamine	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachloroethane	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Nitrobenzene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Isophorone	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Nitrophenol	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dimethylphenol	4100	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
bis(2-Chloroethoxy) methane	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dichlorophenol	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
1,2,4-Trichlorobenzene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Naphthalene	390	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Chloroaniline	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorobutadiene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Chloro-3-methylphenol	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Methylnaphthalene	200	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorocyclopentadiene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4,6-Trichlorophenol	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4,5-Trichlorophenol	1200	R	ug/l	1200	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
2-Chloronaphthalene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2-Nitroaniline	1200	R	ug/l	1200	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Dimethylphthalate	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Acenaphthylene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,6-Dinitrotoluene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
3-Nitroaniline	1200	R	ug/l	1200	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Acenaphthene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrophenol	1200	R	ug/l	1200	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
4-Nitrophenol	1200	R	ug/l	1200	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Dibenzofuran	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
2,4-Dinitrotoluene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Diethylphthalate	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Chlorophenyl-phenylether	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Fluorene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Nitroaniline	1200	R	ug/l	1200	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
4,6-Dinitro-2-methylphenol	1200	R	ug/l	1200	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
N-Nitrosodiphenylamine (1)	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
4-Bromophenyl-phenylether	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Hexachlorobenzene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Pentachlorophenol	1200	R	ug/l	1200	25	U	ug/l	25	25	U	ug/l	25	25	U	ug/l	25
Phenanthrene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Anthracene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Carbazole	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Di-n-butylphthalate	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Fluoranthene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Pyrene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Butylbenzylphthalate	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10

000458

06/15/94 NAS CECIL FIELD -- OPERABLE UNIT 2 -- SITE 17 15:30:07
VALIDATED DATA -- SEMIVOLATILES

Lab Sample Number:	J2134				J2143				J2624				J2622			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17MW24S				CF17MW25SI				CF17MW26I				CF17MW27D			
Collect Date:	11-JAN-94				11-JAN-94				12-JAN-94				12-JAN-94			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
3,3-Dichlorobenzidine	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (a) anthracene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Chrysene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
bis(2-Ethylhexyl) phthalate	500	R	ug/l	500	.6	J	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Di-n-octylphthalate	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (b) fluoranthene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (k) fluoranthene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (a) pyrene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Indeno (1,2,3-cd) pyrene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Dibenz (a,h) anthracene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10
Benzo (g,h,i) perylene	500	R	ug/l	500	10	U	ug/l	10	10	U	ug/l	10	10	U	ug/l	10

U = NON DETECTED J = ESTIMATED
I' REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
ESULT IS REJECTED AND UNUSABLE

000458

Lab Sample Number:	J2623			
Site	CECIL2			
Locator	CF17MW28DD			
Collect Date:	12-JAN-94			
	VALUE	QUAL	UNITS	DL
CLP SEMIVOLATILES 90-SOW				
Phenol	10	U	ug/l	10
bis(2-Chloroethyl) ether	10	U	ug/l	10
2-Chlorophenol	10	U	ug/l	10
1,3-Dichlorobenzene	10	U	ug/l	10
1,4-Dichlorobenzene	10	U	ug/l	10
1,2-Dichlorobenzene	10	U	ug/l	10
2-Methylphenol	10	U	ug/l	10
2,2-oxybis(1-Chloropropene)	10	U	ug/l	10
4-Methylphenol	10	U	ug/l	10
N-Nitroso-di-n-propylamine	10	U	ug/l	10
Hexachloroethane	10	U	ug/l	10
Nitrobenzene	10	U	ug/l	10
Isophorone	10	U	ug/l	10
2-Nitrophenol	10	U	ug/l	10
2,4-Dimethylphenol	10	U	ug/l	10
bis(2-Chloroethoxy) methane	10	U	ug/l	10
2,4-Dichlorophenol	10	U	ug/l	10
1,2,4-Trichlorobenzene	10	U	ug/l	10
Naphthalene	10	U	ug/l	10
4-Chloroaniline	10	U	ug/l	10
Hexachlorobutadiene	10	U	ug/l	10
4-Chloro-3-methylphenol	10	U	ug/l	10
2-Methylnaphthalene	10	U	ug/l	10
Hexachlorocyclopentadiene	10	U	ug/l	10
2,4,6-Trichlorophenol	10	U	ug/l	10
2,4,5-Trichlorophenol	25	U	ug/l	25
2-Chloronaphthalene	10	U	ug/l	10
2-Nitroaniline	25	U	ug/l	25
Dimethylphthalate	10	U	ug/l	10
Acenaphthylene	10	U	ug/l	10
2,6-Dinitrotoluene	10	U	ug/l	10
3-Nitroaniline	25	U	ug/l	25
Acenaphthene	10	U	ug/l	10
2,4-Dinitrophenol	25	U	ug/l	25
4-Nitrophenol	25	U	ug/l	25
Dibenzofuran	10	U	ug/l	10
2,4-Dinitrotoluene	10	U	ug/l	10
Diethylphthalate	10	U	ug/l	10
4-Chlorophenyl-phenylether	10	U	ug/l	10
Fluorene	10	U	ug/l	10
4-Nitroaniline	25	U	ug/l	25
4,6-Dinitro-2-methylphenol	25	U	ug/l	25
N-Nitrosodiphenylamine (1)	10	U	ug/l	10
4-Bromophenyl-phenylether	10	U	ug/l	10
Hexachlorobenzene	10	U	ug/l	10
Pentachlorophenol	25	U	ug/l	25
Phenanthrene	10	U	ug/l	10
Anthracene	10	U	ug/l	10
Carbazole	10	U	ug/l	10
Di-n-butylphthalate	10	U	ug/l	10
Fluoranthene	10	U	ug/l	10
Pyrene	10	U	ug/l	10

000458

Lab Sample Number:	J2623			
Site	CECIL2			
Locator	CF17MW28DD			
Collect Date:	12-JAN-94			
	VALUE	QUAL	UNITS	DL
Butylbenzylphthalate	10	U	ug/l	10
3,3-Dichlorobenzidine	10	U	ug/l	10
Benzo (a) anthracene	10	U	ug/l	10
Chrysene	10	U	ug/l	10
bis(2-Ethylhexyl) phthalate	10	U	ug/l	10
Di-n-octylphthalate	10	U	ug/l	10
Benzo (b) fluoranthene	10	U	ug/l	10
Benzo (k) fluoranthene	10	U	ug/l	10
Benzo (a) pyrene	10	U	ug/l	10
Indeno (1,2,3-cd) pyrene	10	U	ug/l	10
Dibenz (a,h) anthracene	10	U	ug/l	10
Benzo (g,h,i) perylene	10	U	ug/l	10

U = NON DETECTED J = ESTIMATED
J' - REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
'ESULT IS REJECTED AND UNUSABLE

06/15/94 NAS CECIL FIELD -- OPERABLE UNIT 2 -- SITE 17 15:32:31
VALIDATED DATA -- PESTICIDES AND PCBS

Lab Sample Number:	J2134				J2143				J2624				J2622			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17MW24S				CF17MW25SI				CF17MW26I				CF17MW27D			
Collect Date:	11-JAN-94				11-JAN-94				12-JAN-94				12-JAN-94			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP PESTICIDES/PCBS 90-SOW																
alpha-BHC	.05	R	ug/l	.05	.05	R	ug/l	.05	.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
beta-BHC	.05	R	ug/l	.05	.035	R	ug/l	.05	.04	UJ	ug/l	.04	.05	UJ	ug/l	.05
delta-BHC	.05	R	ug/l	.05	.05	R	ug/l	.05	.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
gamma-BHC (Lindane)	.05	R	ug/l	.05	.05	R	ug/l	.05	.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Heptachlor	.035	R	ug/l	.05	.05	R	ug/l	.05	.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Aldrin	.05	R	ug/l	.05	.05	R	ug/l	.05	.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Heptachlor epoxide	.05	R	ug/l	.05	.05	R	ug/l	.05	.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Endosulfan I	.05	R	ug/l	.05	.05	R	ug/l	.05	.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Dieldrin	.007	R	ug/l	.1	.1	R	ug/l	.1	.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDE	.1	R	ug/l	.1	.1	R	ug/l	.1	.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endrin	.1	R	ug/l	.1	.1	R	ug/l	.1	.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endosulfan II	.09	R	ug/l	.1	.1	R	ug/l	.1	.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDD	.1	R	ug/l	.1	.1	R	ug/l	.1	.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endosulfan sulfate	.1	R	ug/l	.1	.1	R	ug/l	.1	.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
4,4-DDT	.1	R	ug/l	.1	.1	R	ug/l	.1	.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Methoxychlor	.5	R	ug/l	.5	.5	R	ug/l	.5	.5	UJ	ug/l	.5	.5	UJ	ug/l	.5
Endrin ketone	.1	R	ug/l	.1	.1	R	ug/l	.1	.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
Endrin aldehyde	.1	R	ug/l	.1	.1	R	ug/l	.1	.1	UJ	ug/l	.1	.1	UJ	ug/l	.1
alpha-Chlordane	.05	R	ug/l	.05	.05	R	ug/l	.05	.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
gamma-Chlordane	.05	R	ug/l	.05	.05	R	ug/l	.05	.05	UJ	ug/l	.05	.05	UJ	ug/l	.05
Toxaphene	5	R	ug/l	5	5	R	ug/l	5	5	UJ	ug/l	5	5	UJ	ug/l	5
Aroclor-1016	1	R	ug/l	1	1	R	ug/l	1	1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1221	2	R	ug/l	2	2	R	ug/l	2	2	UJ	ug/l	2	2	UJ	ug/l	2
Aroclor-1232	1	R	ug/l	1	1	R	ug/l	1	1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1242	.52	R	ug/l	1	1	R	ug/l	1	1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1248	1	R	ug/l	1	1	R	ug/l	1	1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1254	1	R	ug/l	1	1	R	ug/l	1	1	UJ	ug/l	1	1	UJ	ug/l	1
Aroclor-1260	1	R	ug/l	1	1	R	ug/l	1	1	UJ	ug/l	1	1	UJ	ug/l	1

U = NON DETECTED J = ESTIMATED
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

000458

Lab Sample Number:	J2623			
Site	CECIL2			
Locator	CF17MW28DD			
Collect Date:	12-JAN-94			
	VALUE	QUAL	UNITS	DL
CLP PESTICIDES/PCBS 90-SOW				
alpha-BHC	.05	U	ug/l	.05
beta-BHC	.05	U	ug/l	.05
delta-BHC	.05	U	ug/l	.05
gamma-BHC (Lindane)	.05	U	ug/l	.05
Heptachlor	.05	U	ug/l	.05
Aldrin	.05	U	ug/l	.05
Heptachlor epoxide	.05	U	ug/l	.05
Endosulfan I	.05	U	ug/l	.05
Dieldrin	.1	U	ug/l	.1
4,4-DDE	.1	U	ug/l	.1
Endrin	.1	U	ug/l	.1
Endosulfan II	.1	U	ug/l	.1
4,4-DDD	.1	U	ug/l	.1
Endosulfan sulfate	.1	U	ug/l	.1
4,4-DDT	.1	U	ug/l	.1
Methoxychlor	.5	U	ug/l	.5
Endrin ketone	.1	U	ug/l	.1
Endrin aldehyde	.1	U	ug/l	.1
alpha-Chlordane	.05	U	ug/l	.05
gamma-Chlordane	.05	U	ug/l	.05
Toxaphene	5	U	ug/l	5
Aroclor-1016	1	U	ug/l	1
Aroclor-1221	2	U	ug/l	2
Aroclor-1232	1	U	ug/l	1
Aroclor-1242	1	U	ug/l	1
Aroclor-1248	1	U	ug/l	1
Aroclor-1254	1	U	ug/l	1
Aroclor-1260	1	U	ug/l	1

U = NON DETECTED J = ESTIMATED
' REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
:ESULT IS REJECTED AND UNUSABLE

000458

VALIDATED DATA -- METALS AND CYANIDE

Lab Sample Number:	J2134				J2143				J2624				J2622			
Site	CECIL2				CECIL2				CECIL2				CECIL2			
Locator	CF17MW24S				CF17MW25SI				CF17MW26I				CF17MW27D			
Collect Date:	11-JAN-94				11-JAN-94				12-JAN-94				12-JAN-94			
	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE																
Aluminum	29500		ug/l	200	29000		ug/l	200	2530		ug/l	200	1030		ug/l	200
Antimony	20	U	ug/l	60	20	U	ug/l	60	20	U	ug/l	60	20	U	ug/l	60
Arsenic	3.7		ug/l	10	2	U	ug/l	10	6.2	J	ug/l	10	3.6		ug/l	10
Barium	50.4		ug/l	200	48.3		ug/l	200	13.6	U	ug/l	200	20.8		ug/l	200
Beryllium	3	U	ug/l	5	3	U	ug/l	5	3	U	ug/l	5	3	U	ug/l	5
Cadmium	4	UJ	ug/l	5	4	UJ	ug/l	5	4	UJ	ug/l	5	4	UJ	ug/l	5
Calcium	46200		ug/l	5000	1510	J	ug/l	5000	1700		ug/l	5000	69100		ug/l	5000
Chromium	56.4	J	ug/l	10	38.1	J	ug/l	10	5	UJ	ug/l	10	5	UJ	ug/l	10
Cobalt	13	U	ug/l	50	13	U	ug/l	50	13	U	ug/l	50	13	U	ug/l	50
Copper	16.8	U	ug/l	25	10.7	U	ug/l	25	3.8	U	ug/l	25	5.2	U	ug/l	25
Iron	5520	J	ug/l	100	3310	J	ug/l	100	931	J	ug/l	100	410	J	ug/l	100
Lead	28		ug/l	3	13		ug/l	3	1	UJ	ug/l	3	1	UJ	ug/l	3
Magnesium	3670		ug/l	5000	1840		ug/l	5000	512	U	ug/l	5000	1710		ug/l	5000
Manganese	11300		ug/l	15	8.3	U	ug/l	15	10.9	U	ug/l	15	20.6		ug/l	15
Mercury	.2	U	ug/l	.2	.2	U	ug/l	.2	.2	U	ug/l	.2	.2	U	ug/l	.2
Nickel	24.9	U	ug/l	40	11	U	ug/l	40	11	U	ug/l	40	11	U	ug/l	40
Potassium	23000		ug/l	5000	1230		ug/l	5000	480		ug/l	5000	978		ug/l	5000
Selenium	10	U	ug/l	5	4.4		ug/l	5	2	U	ug/l	5	2	UJ	ug/l	5
Silver	2.4	U	ug/l	10	2	U	ug/l	10	2	U	ug/l	10	2	U	ug/l	10
Sodium	95700		ug/l	5000	8230		ug/l	5000	5730		ug/l	5000	13100		ug/l	5000
Thallium	1	U	ug/l	10	1	U	ug/l	10	1	U	ug/l	10	1	U	ug/l	10
Vanadium	39.5	J	ug/l	50	25	UJ	ug/l	50	5.8	UJ	ug/l	50	5.2	UJ	ug/l	50
Zinc	228	J	ug/l	20	27.8	U	ug/l	20	33.6	U	ug/l	20	17.4	U	ug/l	20
Cyanide	5	UJ	ug/l	10	5	UJ	ug/l	10	6.6	UJ	ug/l	10	5	UJ	ug/l	10

U = NON DETECTED J = ESTIMATED
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

000458

06/15/94 NAS CECIL FIELD -- OPERABLE UNIT 2 -- SITE 17 15:33:47
VALIDATED DATA -- METALS AND CYANIDE

Lab Sample Number:	J2623			
Site	CECIL2			
Locator	CF17MW28DD			
Collect Date:	12-JAN-94			
	VALUE	QUAL	UNITS	DL
CLP METALS AND CYANIDE				
Aluminum	51.9	U	ug/l	200
Antimony	20	U	ug/l	60
Arsenic	6		ug/l	10
Barium	36.4		ug/l	200
Beryllium	3	U	ug/l	5
Cadmium	4	UJ	ug/l	5
Calcium	58500		ug/l	5000
Chromium	5	UJ	ug/l	10
Cobalt	13	U	ug/l	50
Copper	2	U	ug/l	25
Iron	8	R	ug/l	100
Lead	1	UJ	ug/l	3
Magnesium	7620		ug/l	5000
Manganese	13.2	U	ug/l	15
Mercury	.2	U	ug/l	.2
Nickel	11	U	ug/l	40
Potassium	2170		ug/l	5000
Selenium	2	UJ	ug/l	5
Silver	2	U	ug/l	10
Sodium	9690		ug/l	5000
Thallium	1	U	ug/l	10
Vanadium	2.6	UJ	ug/l	50
Zinc	19	U	ug/l	20
Cyanide	5	UJ	ug/l	10

U = NON DETECTED J = ESTIMATED
I' REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
ESULT IS REJECTED AND UNUSABLE

000458

NAS CECIL FIELD -- BACKGROUND SUBSURFACE SOIL -- METALS AND CYANIDE
RISK ASSESSMENT REPORT -- VALIDATED DATA

Site : CECIL

05-AUG-93 ---thru--- 21-SEP-93

Locator List:	Parameter	Units	# Occurrences	# Hits	Mean	Maximum	Minimum	Std Dev
CFBBMS1S0	CLP METALS AND CYANIDE							
CFBBMS1S6	Aluminum	mg/kg	18	18	5619.50	15600.00	710.00	4903.83
CFBBMS2S2	Arsenic	mg/kg	18	2	.82	.98	.65	.23
CFBBMS2S6	Barium	mg/kg	18	11	6.96	10.60	2.20	2.65
CFBBMS3I2	Calcium	mg/kg	18	8	165.63	312.00	102.00	82.44
CFBBMS3I6	Chromium	mg/kg	18	14	7.55	17.40	2.20	5.37
CFBBMS4S2	Copper	mg/kg	18	1	.58	.58	.58	.00
CFBBMS4S4	Iron	mg/kg	18	18	1421.67	5660.00	104.00	1726.80
CFBBMS5S2	Lead	mg/kg	18	15	6.75	18.80	1.60	4.76
CFBBMS5S6	Magnesium	mg/kg	18	10	109.87	239.00	11.50	66.48
CFBBMS6I0	Manganese	mg/kg	18	5	3.94	4.50	3.20	.53
CFBBMS6I6	Mercury	mg/kg	19	1	.55	.55	.55	.00
CFBBMS7S0	Nickel	mg/kg	18	5	2.70	3.90	1.80	.90
CFBBMS7S4	Potassium	mg/kg	18	10	76.40	158.00	17.00	47.94
CFBBMS8S2	Sodium	mg/kg	18	6	156.17	225.00	117.00	39.32
CFBBMS8S6	Vanadium	mg/kg	18	10	7.69	15.10	1.40	4.80
CFBBMS9I0								
CFBBMS9I6								

APPENDIX C

SOIL ACTION LEVEL COMPARISON TABLES

Table C-1
Comparison of Surface Soil Screening Samples to Potential Soil Action Levels

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Chemical	Residential Soil(1) (mg/kg)	TC Level (mg/L)	20XTC (2) (mg/kg)	Tap Water(1) (mg/L)	20XTAP (2) (mg/kg)	FLORIDA MCL(3) (mg/L)	20XMCL (2) (mg/kg)	AGSS-17-4 0-2' (mg/kg)	AGSS-17-4 0-2'D (mg/kg)	AGSS-17-6 0-2' (mg/kg)	AGSS-17-6 0-2'D (mg/kg)	AGSS-17-8 0-2' (mg/kg)	AGSS-17-10 0-2' (mg/kg)
Ethylbenzene	7800	NL	–	1.3	26	0.7	14			0.0039	0.013		
TRPH	NL	NL	–	NL	–	5	100	8.3	4.1	170	***500***	92	22
Location within 50 ppm TRPH Remediation Limits								Y	Y	Y	Y	Y	N

Chemical	Residential Soil(1) (mg/kg)	TC Level (mg/L)	20XTC (2) (mg/kg)	Tap Water(1) (mg/L)	20XTAP (2) (mg/kg)	FLORIDA MCL(3) (mg/L)	20XMCL (2) (mg/kg)	AGSS-17-1 0-2' (mg/kg)	AGSS-17-1 0-2' (mg/kg)	AGSS-17-2 0-2' (mg/kg)	AGSS-17-2 0-2' (mg/kg)	AGSS-17-2 0-2' (mg/kg)	AGSS-17-33 0-2' (mg/kg)
TRPH	NL	NL	–	NL	–	5	100	6.2	10	***630***	5.9	24	51
Location within 50 ppm TRPH Remediation Limits								N	Y	Y	Y	N	Y

Chemical	Residential Soil(1) (mg/kg)	TC Level (mg/L)	20XTC (2) (mg/kg)	Tap Water(1) (mg/L)	20XTAP (2) (mg/kg)	FLORIDA MCL(3) (mg/L)	20XMCL (2) (mg/kg)	AGSS-17-3 0-2' (mg/kg)	AGSS-17-3 0-2' (mg/kg)	AGSS-17-3 0-2' (mg/kg)	AGSS-17-4 0-2' (mg/kg)	AGSS-17-4 0-2' (mg/kg)	AGSS-17-44 0-2'D (mg/kg)
TRPH	NL	NL	–	NL	–	5	100	46	4.5	11	8.1	***680***	18
Location within 50 ppm TRPH Remediation Limits								N	N	N	N	Y	Y

Chemical	Residential Soil(1) (mg/kg)	TC Level (mg/L)	20XTC (2) (mg/kg)	Tap Water(1) (mg/L)	20XTAP (2) (mg/kg)	FLORIDA MCL(3) (mg/L)	20XMCL (2) (mg/kg)	AGSS-17-4 0-2' (mg/kg)	AGSS-17-4 0-2' (mg/kg)	AGSS-17-4 0-2' (mg/kg)	AGSS-17-5 0-2' (mg/kg)	AGSS-17-5 0-2' (mg/kg)	AGSS-17-56 0-2' (mg/kg)
1,2-Dichlorobenzene	7000	NL	–	0.37	7.4	0.6	12	1.9					
TRPH	NL	NL	–	NL	–	5	100	***11000***	9.5	7.7	9.5	7.2	4.6
Location within 50 ppm TRPH Remediation Limits								Y	Y	N	Y	Y	Y

Table C-2
Comparison of Boring Screening Samples to Potential Soil Action Levels

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Chemical	Residential Soil(1) (mg/kg)	TC Level (mg/L)	20XTC (2) (mg/kg)	Tap Water(1) (mg/L)	20XTAP (2) (mg/kg)	FLORIDA MCL(3) (mg/L)	20XMCL (2) (mg/kg)	GSS-17-1 0-2' (mg/kg)	GSS-17-2 4-6' (mg/kg)	GSS-17-2 4-6'D (mg/kg)	GSS-17-2 6-8' (mg/kg)	GSS-17-3 4-6' (mg/kg)	GSS-17-3 6-8' (mg/kg)
Toluene	16000	NL	–	0.75	15	1	20		1.8	2.3		2.3	0.62
Ethylbenzene	7800	NL	–	1.3	26	0.7	14		1.2	1.5		1.3	0.37
Total Xylenes	160000 (4)	NL	–	1.4 (4)	28	10	200		6.8	9.1		6.8	2.1
1,2-Dichlorobenzene	7000	NL	–	0.37	7.4	0.6	12	0.0049				0.33	
TRPH	NL	NL	–	NL	–	5	100	***1700***	***7500***	***1700***	***130***	***5800***	***1800***
Location within 50 ppm TRPH Remediation Limits								Y	Y	Y	Y	Y	Y

Chemical	Residential Soil(1) (mg/kg)	TC Level (mg/L)	20XTC (2) (mg/kg)	Tap Water(1) (mg/L)	20XTAP (2) (mg/kg)	FLORIDA MCL(3) (mg/L)	20XMCL (2) (mg/kg)	GSS-17-6 6-8' (mg/kg)	GSS-17-7 0-2' (mg/kg)	GSS-17-8 0-2' (mg/kg)	GSS-17-11 4-6' (mg/kg)	GSS-17-11 6-8' (mg/kg)	GSS-17-14 6-8' (mg/kg)
Trichloroethene	58	0.5	10	0.0016	0.032	0.003	0.06						0.0025
Toluene	16000	NL	–	0.75	15	1	20					0.004	
Ethylbenzene	7800	NL	–	1.3	26	0.7	14						0.0058
Total Xylenes	160000 (4)	NL	–	1.4 (4)	28	10	200						0.3
1,2-Dichlorobenzene	7000	NL	–	0.37	7.4	0.6	12						0.0057
TRPH	NL	NL	–	NL	–	5	100	5.4	12	3.5	4.6		18
Location within 50 ppm TRPH Remediation Limits								N	N	N	N	N	N

Chemical	Residential Soil(1) (mg/kg)	TC Level (mg/L)	20XTC (2) (mg/kg)	Tap Water(1) (mg/L)	20XTAP (2) (mg/kg)	FLORIDA MCL(3) (mg/L)	20XMCL (2) (mg/kg)	GSS-17-15 4-6' (mg/kg)	GSS-17-15 6-8'D (mg/kg)	GSS-17-16 0-2' (mg/kg)	GSS-17-17 2-4' (mg/kg)
1,1,1-Trichloroethane	7000	NL	–	1.3	26	0.2	4				0.0028
TRPH	NL	NL	–	NL	–	5	100	57	3.8	8.7	
Location within 50 ppm TRPH Remediation Limits								Y	N	N	Y

NOTES:
Validation qualifiers not shown.
Detections only are reported.
Shading indicates results that exceed one or more of the potential soil action levels.
(1) Risk based concentration levels reported by USEPA Region III January 7, 1994.
(2) Relationship between water and soil based on TCLP extraction procedure.
(3) Florida MCLs from Florida Administrative Code 17-550, "Safe Drinking Water Act", January, 1993.
(4) Total xylene not available, highest value from o-, m-, or p-xylene reported.
TC=Toxicity characteristic
NL=Not listed
D=Duplicate
TRPH=Total recoverable petroleum hydrocarbons

000458

Table C–3 (continued)
Comparison of Confirmation Boring Soil Samples to Potential Soil Action Level

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Chemical	Residential Soil(1) (mg/kg)	TC Level (mg/L)	20XTC (2) (mg/kg)	Tap Water(1) (mg/L)	20XTAP (2) (mg/kg)	FLORIDA MCL(3) (mg/L)	20XMCL (2) (mg/kg)	BOR–17–7 2–4' (mg/kg)	BOR–17–8 0–2' (mg/kg)	BOR–17–8 2–4' (mg/kg)	BOR–17–9 0–2' (mg/kg)	BOR–17–9 2–4' (mg/kg)	BOR–17–1(0–2' (mg/kg)	BOR–17–1(2–4' (mg/kg)
Methylene chloride	85	NL	–	0.0041	0.082	0.005	0.1	–	–	0.004	–	–	0.003	–
Acetone	7800	NL	–	3.7	74	NL	–	1.6	5.7	0.18	–	–	–	3.9
Toluene	16000	NL	–	0.75	15	1	20	0.59	–	–	–	–	–	1.4
2–Butanone	47000	200	4000	22	440	NL	–	–	–	0.004	–	–	–	–
Ethylbenzene	7800	NL	–	1.3	26	0.7	14	0.53	–	–	–	–	–	0.58
Xylenes (total)	160000(4)	NL	–	1.4(4)	28	10	200	4.2	–	–	–	–	–	14
1,3–Dichlorobenzene	7000	NL	–	0.54	10.8	NL	–	–	–	–	–	–	–	0.92
1,4–Dichlorobenzene	27	7.5	150	0.00044	0.0088	0.075	1.5	–	–	–	–	–	–	***0.73***
1,2–Dichlorobenzene	7000	NL	–	0.37	7.4	0.6	12	–	–	–	–	–	0.068	***18***
Naphthalene	3100	NL	–	1.5	30	0.1	2	15	–	–	–	–	–	***19***
2–Methylnaphthalene	NL	NL	–	NL	–	0.1	2	42	–	–	–	–	–	***47***
Dibenzofuran	NL	NL	–	NL	–	NL	–	1.6	–	–	–	–	–	1.9
Di–n–butylphthalate	7800	NL	–	3.7	74	NL	–	–	0.037	0.1	–	0.06	–	–
Fluoranthene	3100	NL	–	1.5	30	NL	–	0.8	–	–	–	–	–	–
bis(2–Ethylhexyl) phthalate	46	NL	–	0.0048	0.096	0.004	0.08	–	***0.096***	0.063	***0.083***	0.025	0.076	–
Aldrin	0.038	NL	–	0.004	0.08	NL	–	–	–	0.0023	–	–	–	–
4,4–DDE	1.9	NL	–	0.0002	0.004	NL	–	–	–	–	0.00044	–	–	–
Aluminum	230000	NL	–	110	2200	0.2	4	***928***	***5050***	***4430***	***1440***	***1170***	***776***	***806***
Barium	5500	100	2000	2.6	52	2	40	–	9.5	***54***	–	–	4.6	–
Calcium	NL	NL	–	NL	–	NL	–	653	1430	247	7530	741	924	318
Chromium	390(5)	5	100	0.18(5)	3.6	NL	–	***6.6***	***4.8***	3.5	3.1	***5***	***8.5***	***7.2***
Copper	2900	NL	–	1.4	28	1	20	–	–	–	–	–	1.9 J	–
Iron	NL	NL	–	NL	–	0.3	6	***120***	***699***	***208***	***198***	***92.6***	***169***	***128***
Lead	0.0078(6)	5	100	3.7E–06(6)	0.000074	0.015	0.3	***20.1***	***10.2***	***2.3***	***2***	***0.91***	***9.3***	***20.9***
Magnesium	NL	NL	–	NL	–	NL	–	–	134	–	75.2	–	–	–
Manganese	390	NL	–	0.18	3.6	0.05	1	***29.5***	***8.1***	–	***4.1***	–	***112***	***77.9***
Sodium	NL	NL	–	NL	–	160	3200	153	252	220	149	170	155	169
Thallium	NL	NL	–	NL	–	0.002	0.04	***0.27***	–	–	–	–	–	–
Vanadium	550	NL	–	0.26	5.2	NL	–	0.95	3.5	1.6	1.6	***6.2***	–	0.82
Zinc	NL	NL	–	NL	–	5	100	–	–	6.6	–	–	–	–
TRPH	NL	NL	–	NL	–	5	100	***5900***	–	–	44	–	***540***	***9200***
Location within 50 ppm TRPH Remediation Limits								Y	N	N	Y	Y	Y	Y

000458

Table C-3 (continued)
Comparison of Confirmation Boring Soil Samples to Potential Soil Action Level

Focused Feasibility Study, Site 17
Source Control Remedial Alternatives
NAS Cecil Field, Jacksonville, Florida

Chemical	Residential Soil(1) (mg/kg)	TC Level (mg/L)	20XTC (2) (mg/kg)	Tap Water(1) (mg/L)	20XTAP (2) (mg/kg)	FLORIDA MCL(3) (mg/L)	20XMCL (2) (mg/kg)	BOR-17-14 2-4' (mg/kg)	BOR-17-14 2-4'D (mg/kg)	BOR-17-15 0-2' (mg/kg)	BOR-17-15 0-2'D (mg/kg)	BOR-17-15 2-4' (mg/kg)	BOR-17-15 2-4'D (mg/kg)
Acetone	7800	NL	–	3.7	74	NL	–	0.96	0.59	1	0.65	3	2.3
1,4-Dichlorobenzene	27	7.5	150	0.00044	0.0088	0.075	1.5	–	–	–	***0.02***	–	–
bis(2-Ethylhexyl) phthalate	46	NL	–	0.0048	0.096	0.004	0.08	***0.088***	0.046	0.048	***0.089***	***0.15***	***0.27***
Aluminum	230000	NL	–	110	2200	0.2	4	***2,640***	***3,170***	***1,500***	***1,820***	***2,190***	***2,260***
Calcium	NL	NL	–	NL	–	NL	–	266	309	291	223	--	204
Chromium	390(5)	5	100	0.18(5)	3.6	NL	–	–	***6.6***	–	–	–	–
Iron	NL	NL	–	NL	–	0.3	6	***194***	***243***	***223***	***242***	***240***	***315***
Lead	0.0078(6)	5	100	3.7E-06(6)	0.000074	0.015	0.3	***2***	***1.9***	***1.6***	***1.6***	***1.6***	***2.3***
Sodium	NL	NL	–	NL	–	160	3200	152	152	165	222	285	326
Thallium	NL	NL	–	NL	–	0.002	0.04	***0.23***	–	–	–	–	–
Zinc	NL	NL	–	NL	–	5	100	–	–	–	–	–	1.7
TRPH	NL	NL	–	NL	–	5	100	–	–	–	–	–	–
Location within 50 ppm TRPH Remediation Limits								N	N	N	N	N	N

NOTES:
Validation qualifiers not shown.
Detections only are reported.
Shading indicates results that exceed one or more of the potential soil action levels.
(1) Risk based concentration levels reported by USEPA Region III January 7, 1994.
(2) Relationship between water and soil based on TCLP extraction procedure.
(3) Florida MCLs from Florida Administrative Code 17-550, "Safe Drinking Water Act", January, 1993.
(4) Total xylene not available, highest value from o-, m-, or p-xylene reported.
(5) Levels are for hexavalent chromium while sample results are total chromium.
(6) Levels are for tetraethyl lead while sample results are total lead.
TC=Toxicity characteristic
NL=Not listed
D=Duplicate
TRPH=Total recoverable petroleum hydrocarbons

000458

APPENDIX D

VOLUME, AVERAGE CONCENTRATION, AND MASS CALCULATIONS

PROJECT	COMP. BY	JOB NO.
000458 NAS Cecil Field Site 17	SCP	8520-36
	CHK. BY	DATE
	[illegible]	3/9/94

Purpose: Estimate Remediation Volumes, average TRPH Concentrations, and Mass of TRPH

Inputs: Isoconcentration diagrams with defined 50 ppm remediation limits (attached)

Calculations:

0-2' layer:

Surface Area of soils within remediation limits = 39,550 ft^2

Volume of layer = 39,550 · 2/27 = 2930 yd^3

Average concentration:

Say 1% at 10,000 ppm
10% at 1,000 ppm
30% at 500 ppm
40% at 100 ppm
19% at 10 ppm

} Estimated percent of total volume at each concentration

Ave = 392 ppm say 400 ppm

Mass

Assume a density of 1.5 tons/yd^3

$2{,}930\ yd^3 \cdot 1.5\ \frac{tons}{yd^3} \cdot \frac{2000\ \#}{ton} \cdot \frac{454\ g}{\#} \cdot \frac{kg}{1000\ g} \cdot \cancel{\frac{Mil}{1 \times 10^6}} = 3.99\ mil\ kg.$ CP

$3.99\ mkg \cdot \frac{400\ kg}{mkg} = 1{,}596\ kg$ TRPH

2-4' layer

Surface Area = 37,500 ft^2

Volume = 2780 yd^3

Average Concentration

10% at 1,000 ppm
20% at 500 ppm
50% at 100 ppm
20% at 10 ppm

Ave. = 252 ppm say 250 ppm

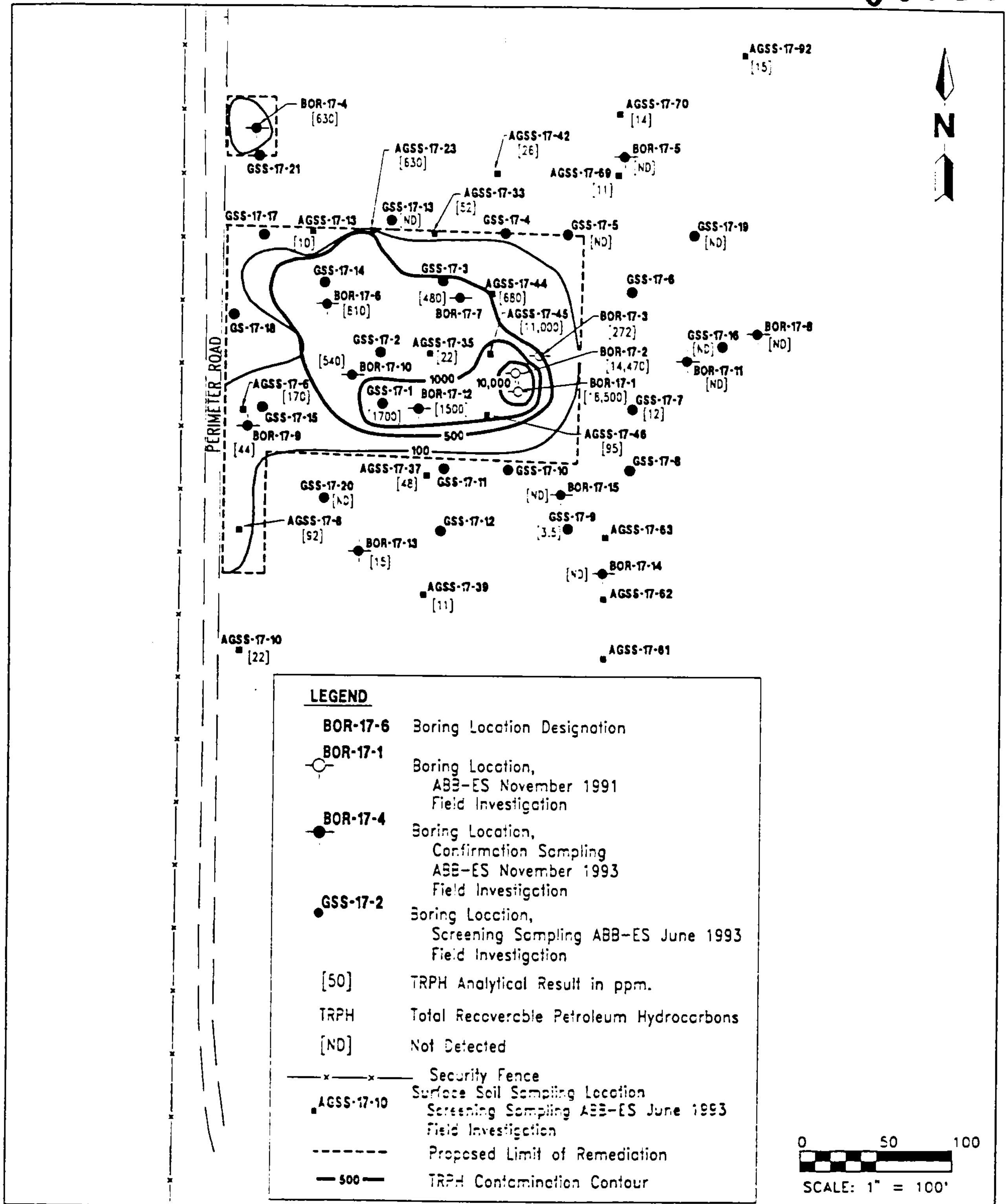


FIGURE D-1
TRPH RESULTS,
0-2 FEET BELOW LAND SURFACE

CECIL/FFS/FS-D1.dwg/NP/3-23-94

SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

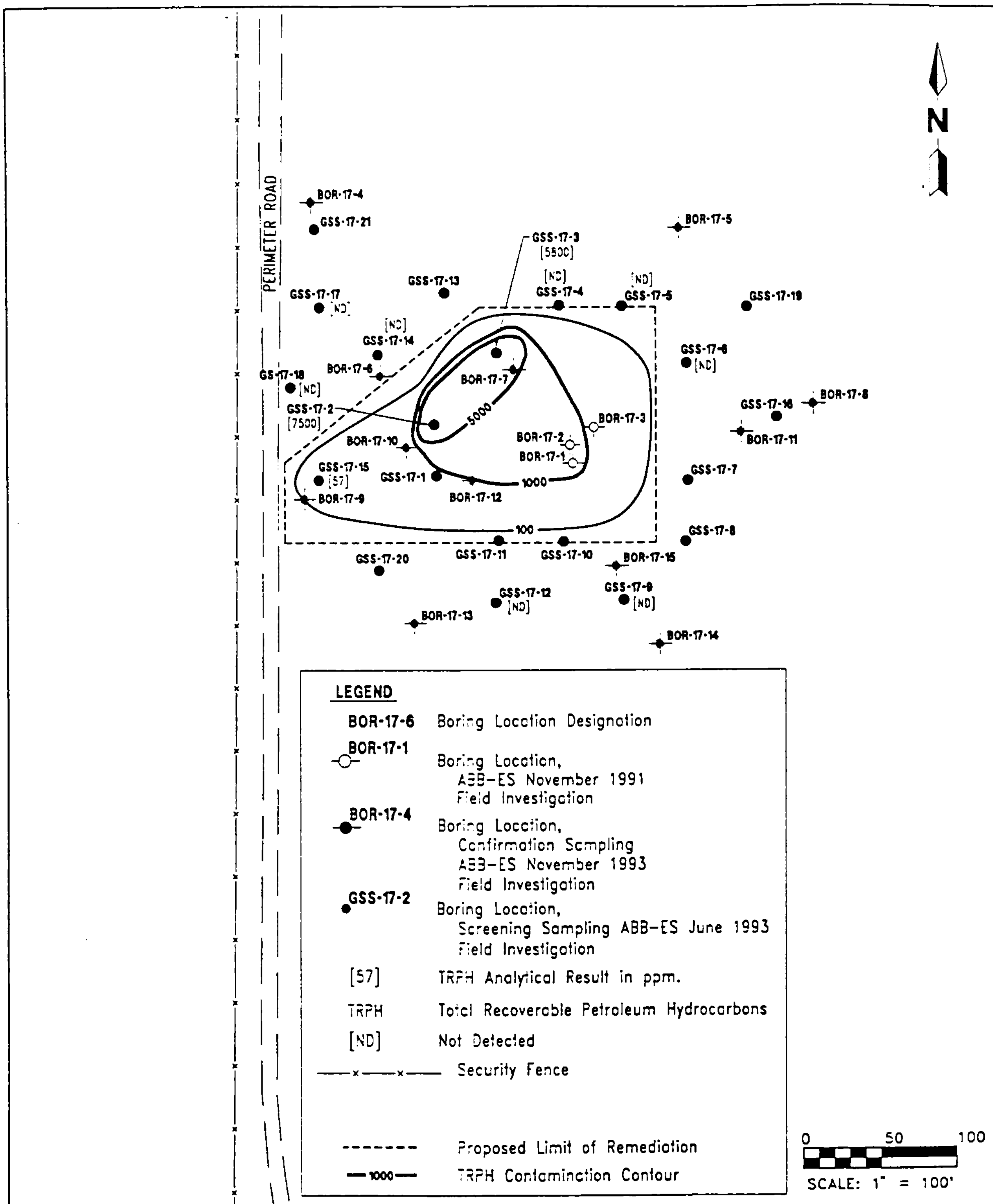


FIGURE D-3
TRPH RESULTS,
4-6 FEET BELOW LAND SURFACE

CECIL\FFS\FS-D3.dwg\NP\3-23-94

FOCUSED FEASIBILITY STUDY
SITE 17, SOURCE CONTROL
REMEDIAL ALTERNATIVES

NAS CECIL FIELD
JACKSONVILLE, FLORIDA

APPENDIX E

EVALUATION OF BACKFILL MATERIAL RECONTAMINATION

000458

PROJECT	COMP. BY	JOB NO.
Site 17 FFS Response to Comments	SCP	8520-36
	CHK. BY	DATE
	SWM	5/19/94

Purpose: Estimate to potential for recontamination of soil backfilled after treatment caused by the fluctuating groundwater table.

Inputs: Analytical data, volume calcs etc from FFS Report

Estimated TRPH mass in soils being treated by interim action alternatives:
5,785 kg (from FFS report)

Highest detected TRPH concentration in the groundwater at Site 17:
1.3 mg/l

Assume a volume of groundwater that is 10 ft deep and 400 ft in diameter around the center of the Site 17 pit contains 1.3 mg/l TRPH. Assume a porosity of 0.33 in this volume. The mass of TRPH in this water is then:

$$\pi(200)^2 \cdot 10\,ft \cdot 7.48\,\frac{gal}{ft^3} \cdot \frac{3.7854\,L}{gal} \cdot 1.3 \cdot \frac{1\,kg}{10^6\,mg} \cdot 0.33 = 15.2\,kg$$

Volume of soil being backfilled: 9,900 yd^3

Assume all of TRPH in groundwater recontaminates half of the backfilled soil. Assume a density of 1.5 tons/yd^3 for the backfilled soil

$$9{,}900\,yd^3 \cdot 0.5 \cdot 1.5 \cdot 2{,}000 \cdot 454\,g/lb \cdot \frac{kg}{1000\,g} \cdot \frac{\text{million kg}}{10^6\,kg} = 6.74 \text{ million kg of soil}$$

SWM

$15.2\,kg / \cancel{0.67}\ 6.74\ \text{mkg} = \cancel{22.5}\ 2.25$ ppm maximum increase in soil TRPH as a result of recontamination of backfill.

SWM

This is based on very conservative assumptions.

Also note the mass of TRPH in groundwater is

$$\frac{15.2}{5785} \times 100 = 0.26\%$$ of TRPH in soils being removed.

FIELD MATERIAL REQUISITION

REQ. NO. G-977

M.R.I. NO.

JOB NO. 22567-~~230~~

DATE 9/25/95

DATE OF ORDER 9-25-95 ☑ VERBAL ☐ FORMAL

DATE MATERIAL REQ'D. 9/26/95

PREPARED BY: Sally Weinman

NOTIFY: Ralph Talmage

DELIVER TO: NAS Cecil Field

REQ'D. FOR Installation of sampling point

APPROVED BY:
1. T.M. ~~[illegible]~~ 9/27/95
2.
3.
4.
5.
6.

P.O. NO. 22567-230-FBR-254

SUPPLIER Milco Safety Rental

TERMS N/30

F.O.B. Jobsite (PPA)

VIA UPS

SHIP DATE 9-25-95

ITEM	QUANTITY/UI	STOCK CODE — DESCRIPTION — FULL DETAIL	COST CODE	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST
1	1	Oil water interface probe	230-130206	175.00 wk	350.00			
		2 weeks Rental period						
		175.00 per week						
		Operating manual to be included						

RECEIVING REPORT

MRR NO.

DATE RECEIVED

P/L NO.

SHIPPER

ORIGIN

CARRIER

P/S NO.

☐ PPD
☐ COLLECT (AMOUNT)

DELIVERY IS: ☐ COMPLETE ☐ PARTIAL

RECEIVED BY:

PREPARED BY:

DATE

TOTALS 350.00 plus tax

QUOTED BY Tim

DATE 9-25-95

BUYER [signature]

2571 (2-78)

Surveyed Coordinates Excavation Limits Turning Points

			EL
100	N5162.0	E5203.6	81.0
101	N5161.6	E5101.4	80.4
102	N5302.4	E5100.1	80.2
103	N5447.6	E5181.3	80.1
104	N5447.5	E5203.9	80.6

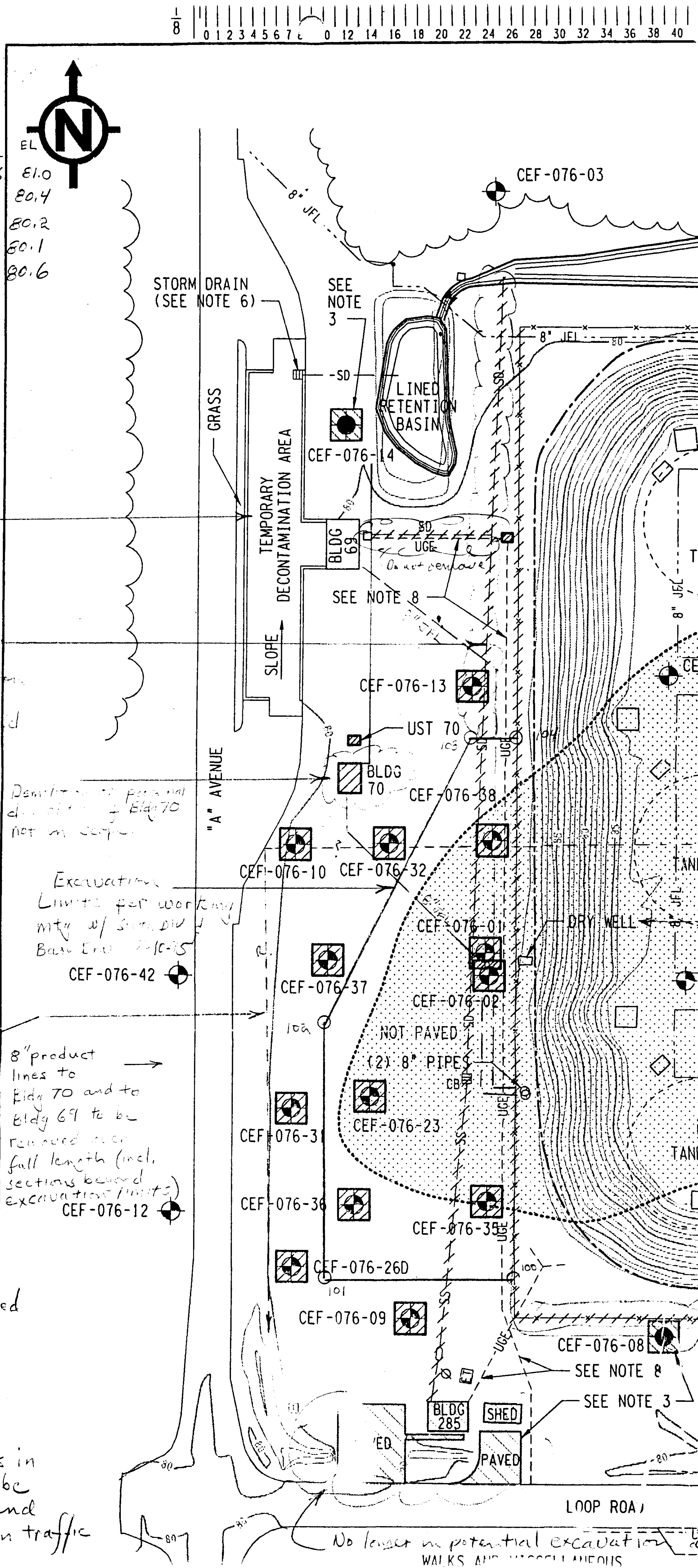
Truck stand is not to be used as temp decon area.

Storm drain North of excavation limits to be left in place; flanged and capped [illegible] reinstalled [illegible] in field.

Deluge system fire line MUST be maintained. Fire line must be located prior to excavation

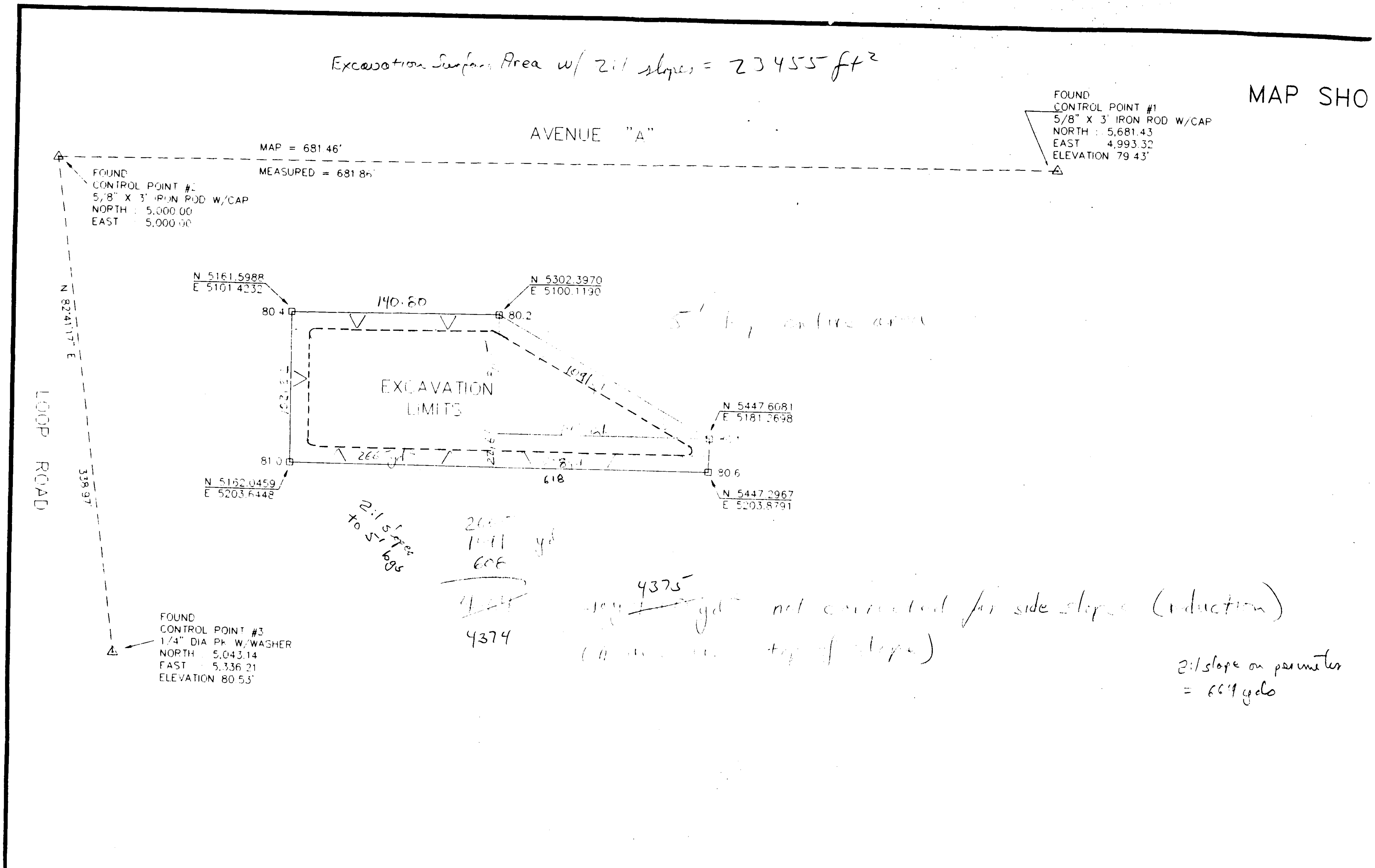
Monitoring Wells to be abandoned
CEF-076-01
-02
-3
-35
-36
-38

All other wells in this area to be maintained and protected from traffic



To be left in place

[illegible] left in place



Excavation Surface Area w/ 2:1 slopes = 23455 ft²
MAP SHO
AVENUE "A"
MAP = 681.46'
MEASURED = 681.86'
FOUND
CONTROL POINT #1
5/8" X 3' IRON ROD W/CAP
NORTH : 5,681.43
EAST 4,993.32
ELEVATION 79.43'
FOUND
CONTROL POINT #2
5/8" X 3' IRON ROD W/CAP
NORTH : 5,000.00
EAST 5,000.00
N 82°41'17" E
338.97'
LOOP ROAD
N 5161.5988
E 5101.4232
N 5302.3970
E 5100.1190
80.4
80.2
140.80
EXCAVATION
LIMITS
N 5447.6081
E 5181.2698
81.0
80.6
618
N 5162.0459
E 5203.6448
N 5447.2967
E 5203.8791
2:1 slopes to 5' bgs
4375 yd³ not corrected for side slopes (reduction)
4374
2:1 slope on perimeter = 669 yds
FOUND
CONTROL POINT #3
1/4" DIA PK W/WASHER
NORTH 5,043.14
EAST 5,336.21
ELEVATION 80.53'

NOTES ON WEST-SIDE

Excavation Limits

1) Established per working meeting w/ Brian Kizer 8-10-95
2) Monitoring wells inside excavation area (6) confirmed for abandonment. Those outside excavation are to be maintained and protected from traffic damage
3) East side excavation limit is at existing fence line
4) Structural demolition limited to UST 70 - no other buildings

Interferences

1) PWC input on utilities required.
2) Pipes, conduits, etc.
   ~ Fire suppression deluge line: ϕ unknown; probable cast iron; no evidence of indicated valve boxes at ground surface (per Brown/Talmey walkover); E-W segment of line would appear to go through middle of excavation. F.D. needs line maintained - break would cause loss of pressure in critical area down A Ave. J. Brown concern - brittleness of pipeline same vintage as tanks.
   ~ Two each 8" ϕ JF lines to be abandoned as of 8-11 walkover w/ B. Kizer. Line to Bldg 70 confirm remove; B Kizer to confirm that line to Bldg 69 will also be completely removed
   ~ There is cathodic protection around mound; exact location not readily available

NOTE: comment during informal meeting "exact shape and size is not known - must be cleared in field" [believe this was from Lou Sprague - RT]

- ~ Dry well / tank and 4" ϕ conduit power supply remain in place
- ~ Storm drain - cut and remove to excavation limit; flange and cap or re install grate/drain box To be coordinated w/ ROICC
- ~ Electrical → duct bank / conduit } conform location, reroute and/or support

Condition of duct bank needs to ascertained when exposed

3) Monitoring wells maintained between excavation and fence must be protected from traffic loading

Fencing

1) General layout of fencing discussed during walkover but not drawn. Area requirements need to be evaluated in planning setup of work area. Fencing will include temporary decon area, probably north of excavation and east of truck unloading pad and Bldg 69; also will include bioslurper ~~treatment~~ compound in open area west of Bldg 285. Gates at north and south ends of area enclosed.

Product Recovery

1) See ABB Tech Memo of 3-17-95 - assuming 200 ft trench across free product plume, inflow of product into trench = 1.05 gal/day - Note

that all ABB calculations including those for bioslurp wells assume fairly flat gradient

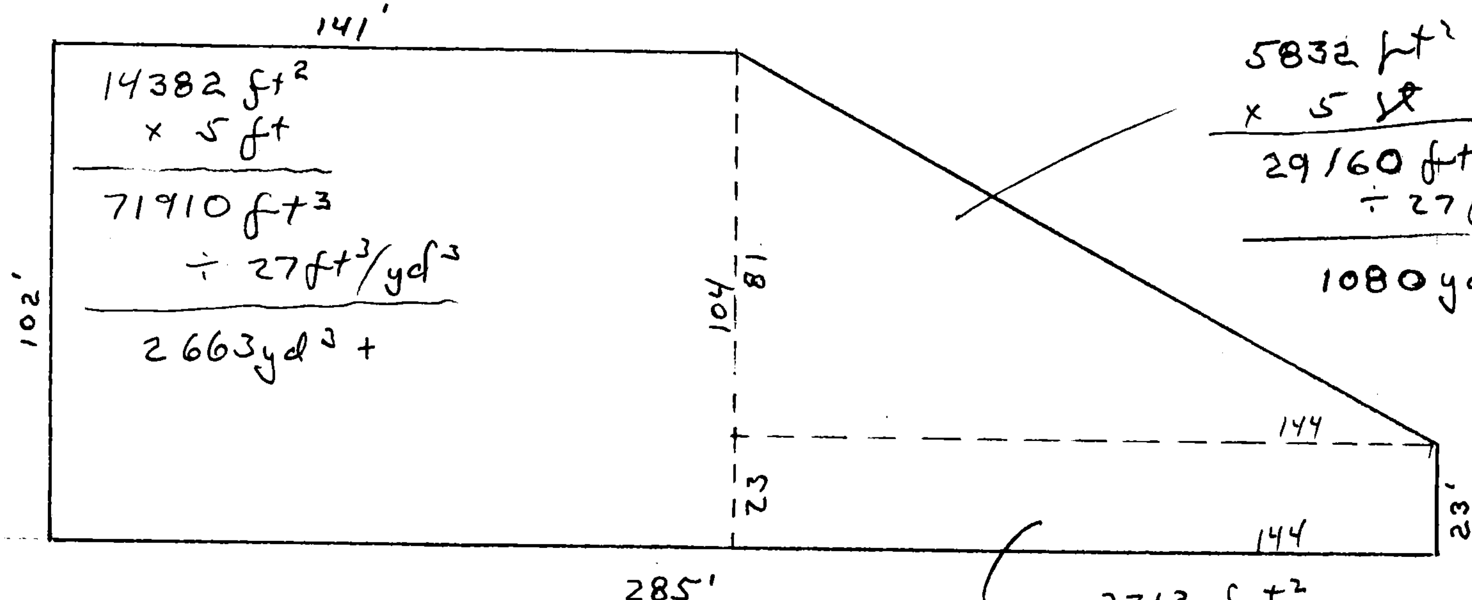
2) ? on work plan — How much water does skimmer pick up? WP reads that skimmer output goes to product holding tank. Where does separator come in? (not bioslurp separator)

West Side Excavation

Max volume — not considering sideslopes or variation in excavation depth; assume all to 5 ft

2663 +
1080
613

4356 yd³   say 4360 yd³



14382 ft²
× 5 ft

71910 ft³
÷ 27 ft³/yd³

2663 yd³ +

5832 ft²
× 5 ft

29160 ft³
÷ 27 ft³/yd³

1080 yd³

3312 ft²
×5 ft

16560 ft³
÷ 27 ft³/yd³

613 yd³

1" = 40'

West Side Excavation

Volume incorporating 2:1 slopes w/ 5' depth everywhere

4356 yd^3 w/o slopes considered

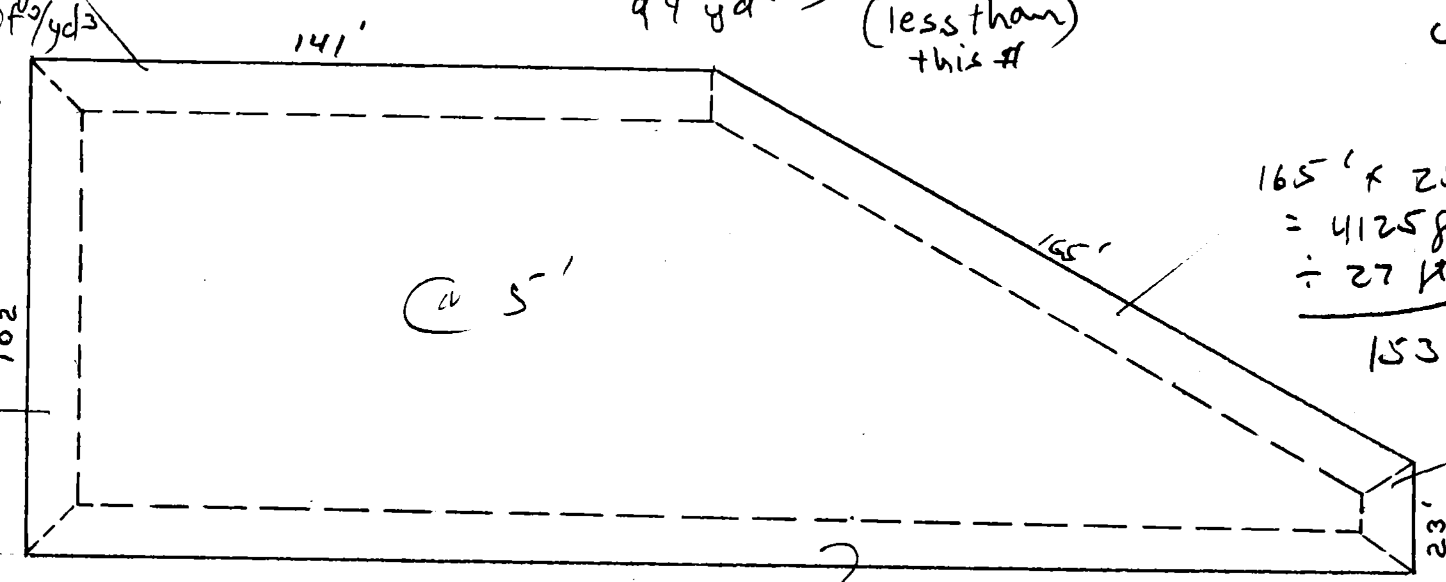
$- 663 \text{ yd}^3$

3693 yd^3 → say 3700 yd^3 considering slopes

Approximate volumes of sideslopes

264 yd^3
21 yd^3
153 yd^3
131 yd^3
94 yd^3
} 663 yd^3 (less than this #)

$141' \times 25 \text{ ft}^2$
3525 ft^3
$\div 27 \text{ ft}^3/\text{yd}^3$
131 yd^3



$102' \times 25 \text{ ft}^2$
2550 ft^3
$\div 27 \text{ ft}^3/\text{yd}^3$
94 yd^3

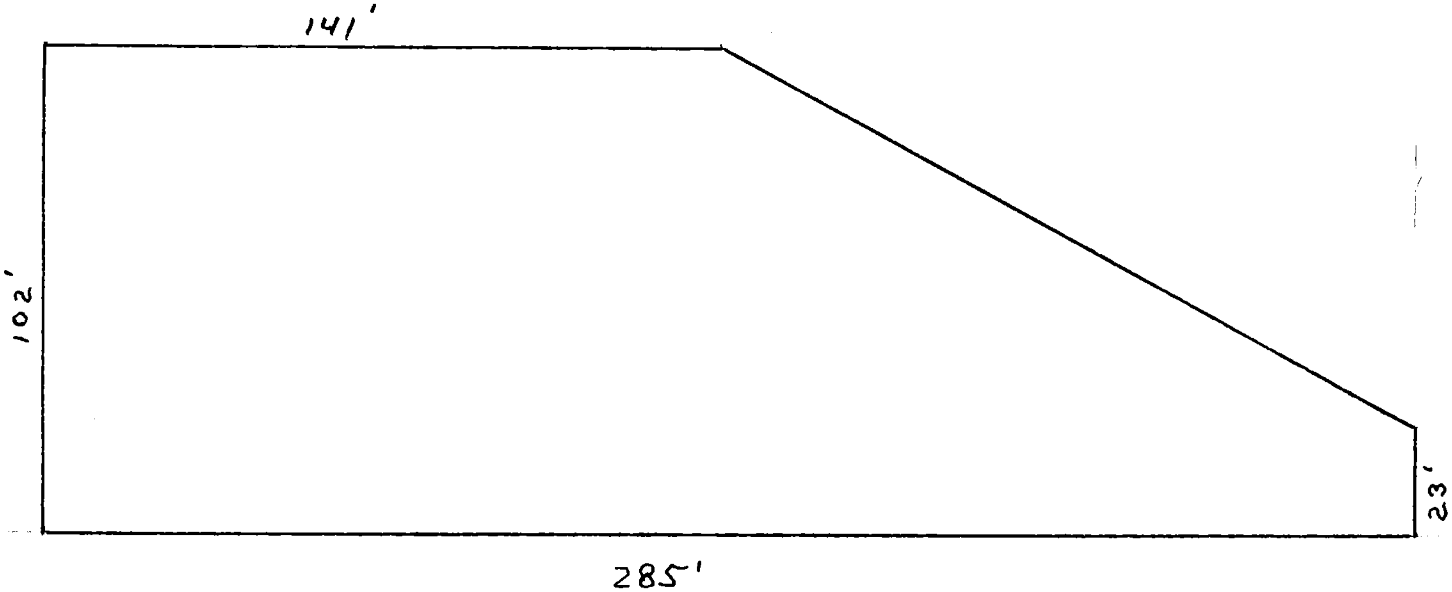
$165' \times 25 \text{ ft}^2$
$= 4125 \text{ ft}^3$
$\div 27 \text{ ft}^3/\text{yd}^3$
153 yd^3

$23' \times 25 \text{ ft}^2$
$= 575 \text{ ft}^3$
$\div 27 \text{ ft}^3/\text{yd}^3$
21 yd^3

$285' \times 25 \text{ ft}^2$
$= 7125 \text{ ft}^3$
$\div 27 \text{ ft}^3/\text{yd}^3$
$= 264 \text{ yd}^3$

5' ◺ 10' ← Typical X-section area
$= \frac{1}{2}(5 \times 10)$
$= 25 \text{ ft}^2$

1" = 40


141'
102'
23'
285'

10-25-95

1. B. Kizer: Distributed "What if" agenda
→ gave background of mtg
→ field sampling - id. product in are not previously I.D. little in prev. i.d. area

2. Mtg to address concerns w/in limits of present excavation as now defined
3. Gave layout of situation - incl dig lines
4. Also gave locations of dig sampling pits and results of headspace
5. BK reviewed history of recent observation of g.w. level. over last 3 wks
6. BK reviewed position re excavation limits as present.
7. BK go to agenda - 2
~~8.~~
→ ① Excavation would cease at that point, excavation would be covered - walls sealed off at that point. Job is finished to address the seeps as is - ~~[illegible]~~

(Fred reviewed excavation procedure)
incl use of absorbents

"WHAT IF ..."

WE WILL ONLY DIG INSIDE THE EXCAVATION LIMITS ALREADY ESTABLISHED ANYTHING OUTSIDE THESE LIMITS IS NOT OPEN FOR DISCUSSION. WE HAVE A LIMITED BUDGET AND MUST WORK WITHIN THESE LIMITS. THIS IS ONLY AN IRA NOT A FINAL ACTION. ANYTHING FOUND BEYOND THE EXISTING SOW DURING CONSTRUCTION WILL BE ADDRESSED IN THE FINAL ACTION.

1 **What if we run out of money and must stop work?**

2 **What if the water table is less than what we originally thought?**

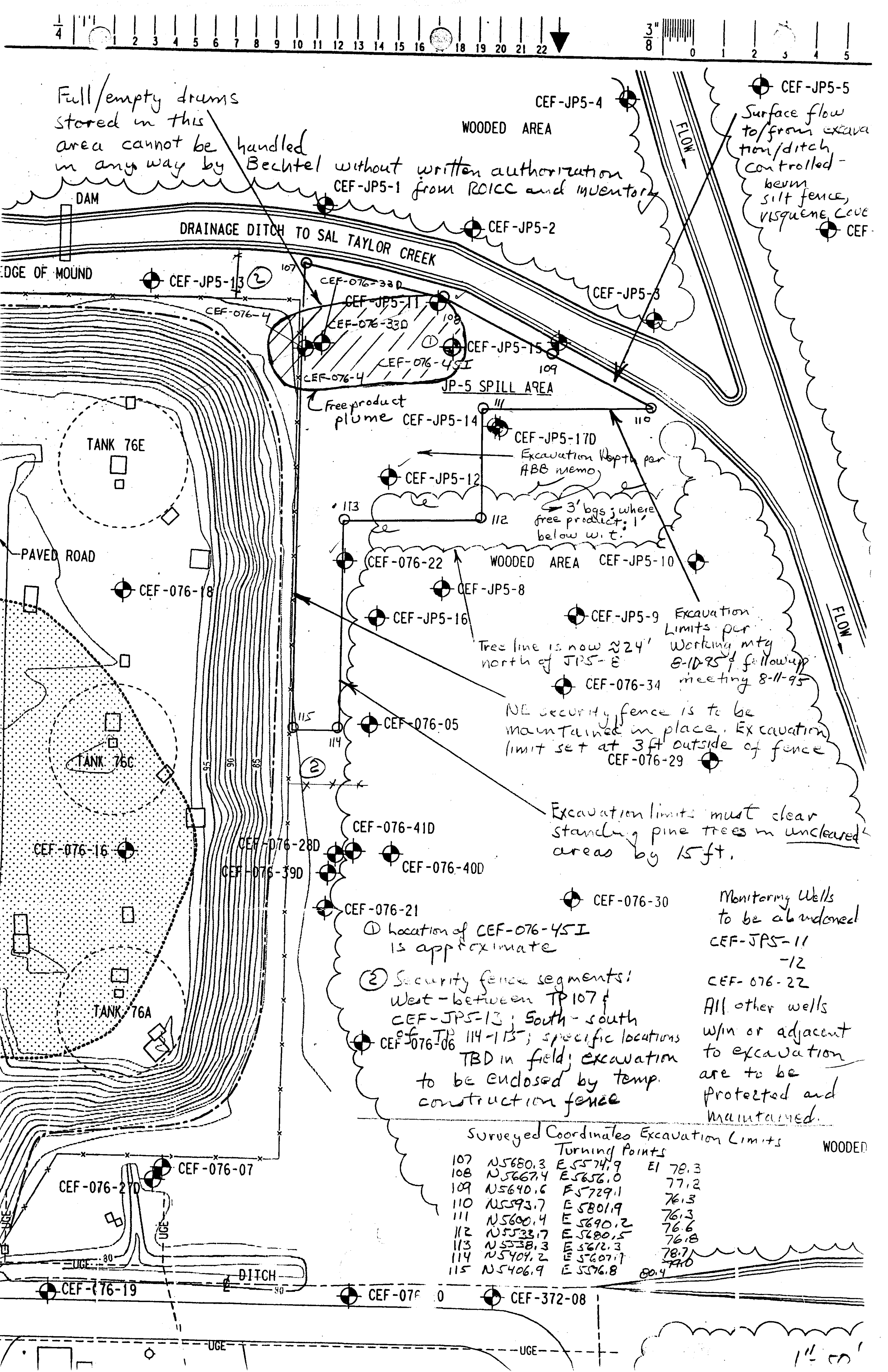
3 **What if the water table is deeper than we originally thought?**

4 **What is the detail for the trench?**

5 **What do we do about the outer limits of the excavation?**

6 **How deep to install HDPE Liner?**

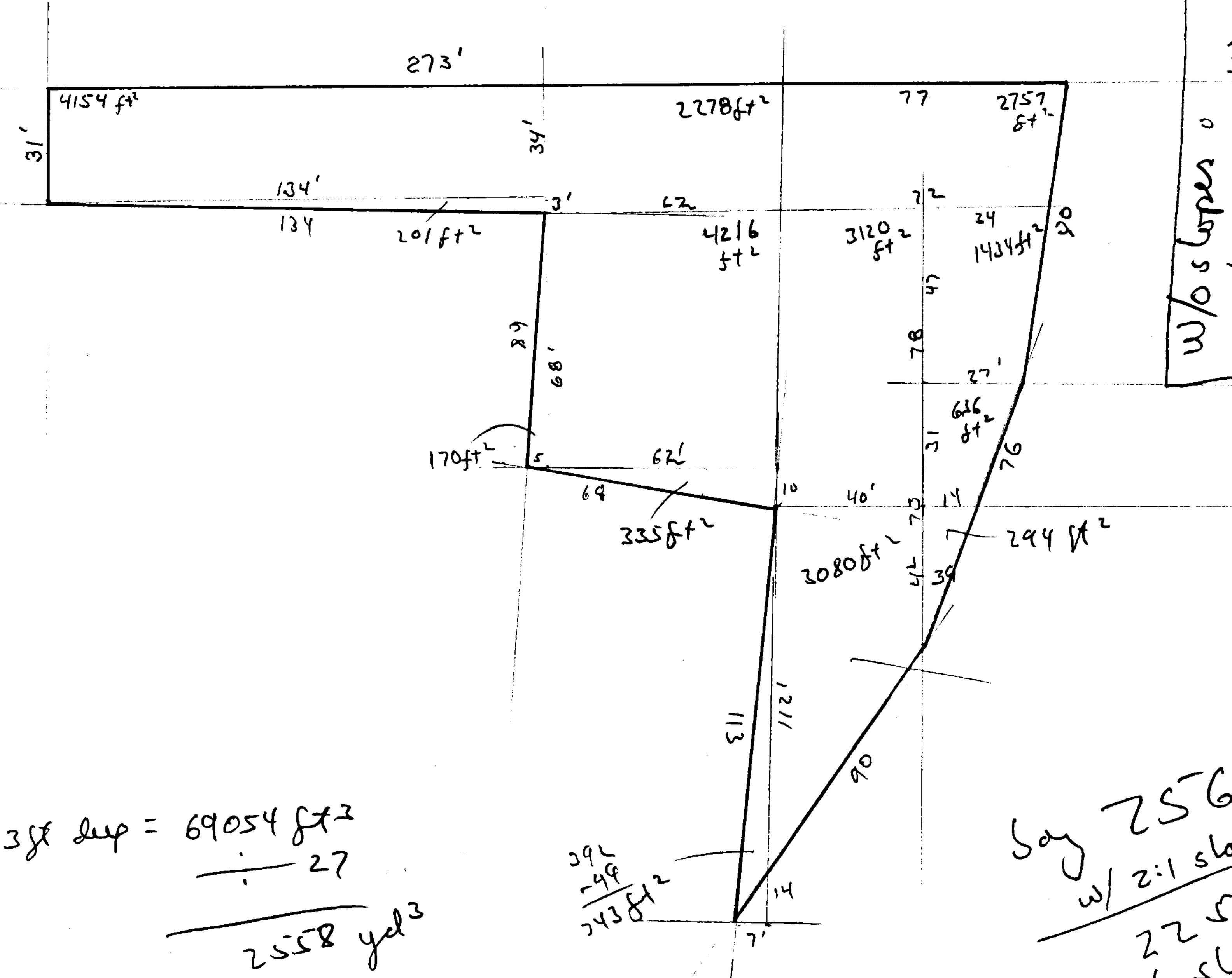
Meeting will end promptly at 12:00 NO LATER



Surveyed Coordinates Excavation Limits Turning Points

107	N5680.3	E5574.9	El 78.3
108	N5667.4	E5656.0	77.2
109	N5640.6	E5729.1	76.3
110	N5593.7	E5801.9	76.3
111	N5600.4	E5690.2	76.6
112	N5533.7	E5680.5	76.8
113	N5538.3	E5612.3	78.7
114	N5404.2	E5607.7	~~79.0~~
115	N5406.9	E5576.8	80.4

East Side Excavation – Including slope volume & all to 3 ft depth



Sq footage
4154
201
170
335
4216
2278
3120
2757
1434
636
294
3080
343

$23018 \text{ ft}^2 \times 3 \text{ ft dep} = 69054 \text{ ft}^3$
$\div 27$
2558 yd^3

2:1
9 ft²

w/o slopes
933' perimeter × 9 ft² x sec
8397 ft³
÷ 27
311 yd³

Say 2560 yd³
w/ 2:1 slopes
2250 yd³
w/o slope volume

1" = 40'

E 5203.8791

ROL POINT #3
DIA PK W/WASHER
H . 5,043.14
: 5,336.21
TION 80.53'

Plume Area = ≈95'×50' = 4750'
(w/in excavation)

If gwl = 94 level
then 1' below gwl
= 3 ft below surface

NOTES:

1.) COORDINATES AND ELEVATION ... ENGINEERING, INC. SHEET NO. C-1 ...

2.) THE TABULAR LIST OF COORDINATE ... & #2 DO NOT COINCIDE WITH THE ... POINTS, PER PLANS BY ENTERPRISE

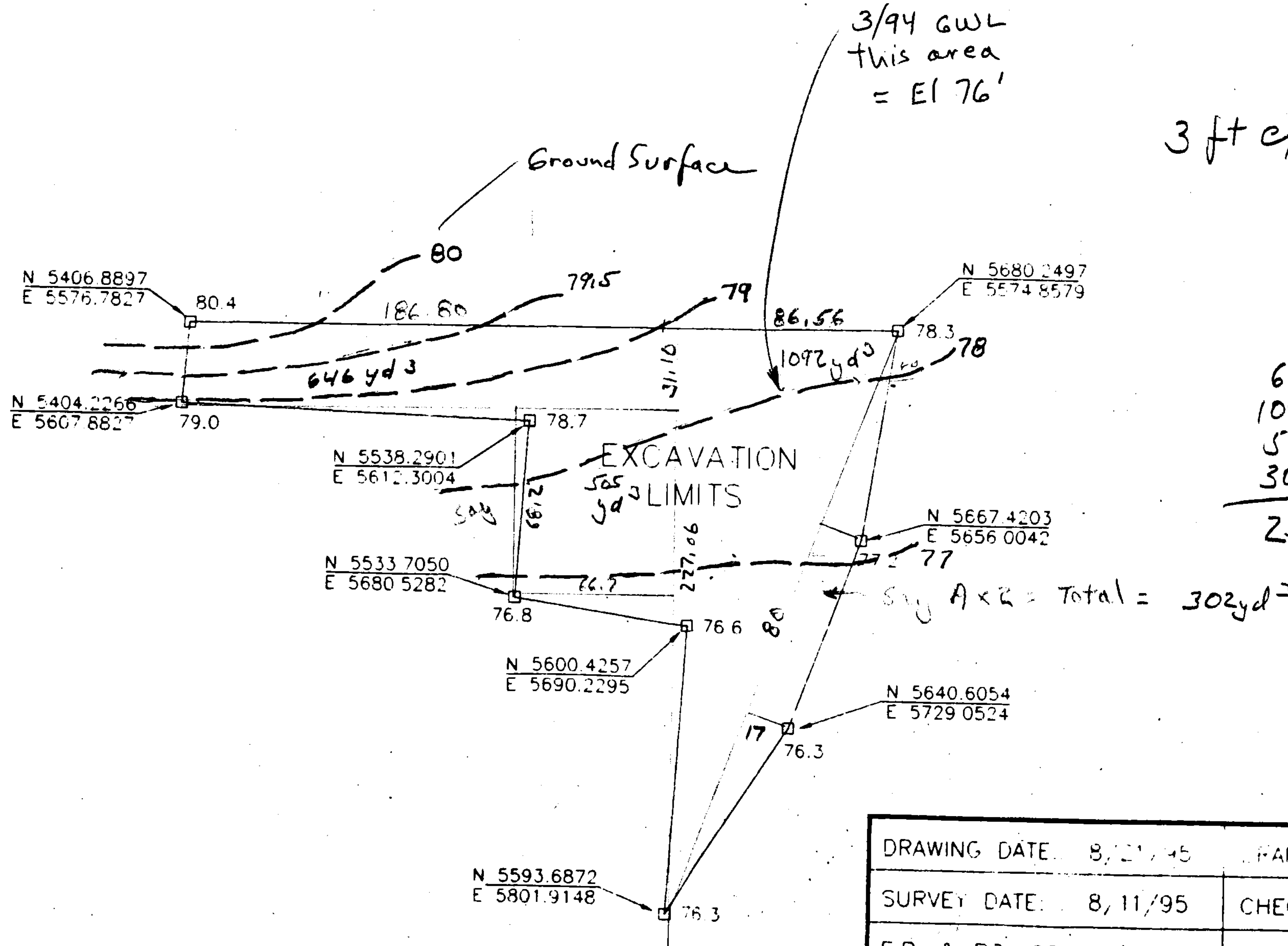
3.) REFERENCE BENCH MARKS USED A... W/CAP KNOW AS CONTROL POINT N... W/WASHER KNOW AS CONTROL PO...

4.) ALL ELEVATIONS SHOWN HEREON A...

LEGEND

□ - FOUND WIRE FLAG CORNER OF EX...

3 ft excavation depth



646
1092
505
302
2545 yd³ @ 3' - not corrected for side slopes or variation w/ depth in plume area

Say 2550 yd³

THE ABOVE LAND WAS SURVEYED UNDER MY ... N AND DIRECTION, THAT THIS SURVEY MEETS ... STANDARDS SET FORTH BY THE FLORIDA ... S IN CHAPTER 61G17-6 FLORIDA ADMINISTRATIVE ... TER 472.027, FLORIDA STATUTES, AND IS TRUE ... ST OF MY KNOWLEDGE AND BELIEF.

...d J. Johns

44...

...T EMBOSSED SEAL.

DRAWING DATE:	8/21/95	DRAFTED BY:	BRADLEY
SURVEY DATE:	8/11/95	CHECKED BY:	JOHNS
F.B. & PG.:	95-06/21-23	CAD FILE	941205CS.DWG
JOB NO.:	94-12-05	DRAWING NO.	...

ARC SU...

PHONE

AGENDA
COORDINATION MEETING
NORTH TANK FUEL FARM
INTERIM REMEDIATION ACTIVITIES
1000 October 4, 1995

1. Introduction and Agenda - General

2. Work Scope and Schedule

3 Mobilization Issues
   - Status of utility clearances
   - Security fencing and gate locations
   - Disposition of drum inventory and soil stockpile
   - Preburn soil analyses

4. Excavation issues
   - Excavation/backfill sequence
   - Installation of vertical barrier
   - Excavation for free product recovery

5. Water control issues
   - Stormwater control around excavations
   - Handling & disposition of excess water in excavation
   - Storage and release of water side discharge from bioslurper system separator
   - Status of discharge to FOTW issues
   - Approved lift station release point

6. Storage/transfer of recovered free product

7. Scheduling of tank inspection and maintenance prior to bioslurper system operation

AGENDA
COORDINATION MEETING
NORTH TANK FUEL FARM
INTERIM REMEDIATION ACTIVITIES
1000 October 4, 1995

1. Introduction and Agenda - General

2. Work Scope and Schedule

3 Mobilization Issues
   - Status of utility clearances
   - Security fencing and gate locations
   - Disposition of drum inventory and soil stockpile
   - Preburn soil analyses

4. Excavation issues
   - Excavation/backfill sequence
   - Installation of vertical barrier
   - Excavation for free product recovery

5. Water control issues
   - Stormwater control around excavations
   - Handling & disposition of excess water in excavation
   - Storage and release of water side discharge from bioslurper system separator
   - Status of discharge to FOTW issues
   - Approved lift station release point

6. Storage/transfer of recovered free product

7. Scheduling of tank inspection and maintenance prior to bioslurper system operation

10/4/95
6:36 AM

DRAFT

MODIFICATIONS TO INTERIM REMEDIATION WORK PLAN
NORTH TANK FUEL FARM
NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Superceded

1.0 Basis for Modification of Scope

The basis for this modification of scope at the North Tank Fuel Farm is the need to maximize the application of available resources to accomplish the overall goals of the interim remedial action in an additional target area at the facility. The interim remediation goals remain unchanged: to remove and treat excessively contaminated soils, and to begin a free product recovery operation in the area of the tank farm. The fundamental modification of scope addresses excavation of excessively contaminated soils and the open excavation recovery of free product. Method of soil treatment and scope of bioslurper recovery system installation and operation are unchanged.

The modifications to implementation of North Tank Fuel Farm interim remedial actions are based on the following understanding of technical direction from the Navy during the preconstruction meeting and ensuing working session of August 9 and 10, 1995:

1) Definition of excessively contaminated soils for site cleanup criteria is revised from 50 PPM to 1000 PPM based on previous OVA headspace measurement.

2) Interim remediation activity is to also include excavation of excessively contaminated soil in the JP-5 spill area northeast of the bermed tank farm.

3) Excavation limits are defined by the Navy and are not controlled by concurrent soil sampling and headspace measurements. Demolition and removal of structures are to be revised accordingly, based on the new excavation limits.

These measures are taken to focus available resources on the areas of severest soil contamination adjacent to the bermed tank farm. Consequently, the area to be excavated between the tank mound and 'A' Avenue and resulting volume of soil to be treated are reduced, and an additional area including a free product plume in the JP-5 spill area northeast of the tank mound is designated for excavation and treatment. The following sections address task-specific scope revisions or additions to the Interim Remediation Work Plan.

2.0 Security Fencing and Temporary Facilities

The security fence on the west side of the bermed tank farm will be relocated to the extent necessary to enclose the construction site, including excavation, work site access, temporary decontamination facility, and bioslurping system treatment compound. Gated access will be provided to accommodate haul truck routing in the most efficient manner and with minimal impact on 'A' Avenue traffic.

The northeast portion of the existing fuel farm security fence adjacent to the excavation in the JP-5 spill area will remain in place. Additional segments of security fencing will be installed in this area between the existing northern security fence and the north side drainage ditch and between the eastern security fence and a point within the adjacent tree line. Exact location and length of security fence segments will be established in the field. In addition, the JP-5 spill area excavation will be surrounded by a temporary construction fence during operations there.

3.0 Monitoring Wall Abandonment

The following monitoring wells are to be abandoned in accordance with provisions of the IRWP:

CEF-076-01	CEF-076-23	CEF-076-38
CEF-076-02	CEF-076-35	CEF-JP5-11
CEF-076-22	CEF-076-36	CEF-JP5-12

All other wells within or adjacent to the defined excavation limits will be maintained and protected from damage throughout the construction activity.

DRAFT

4.0 Demolition and Removal of Miscellaneous Structures and Materials

Demolition and removal of structures will be limited to the following:

1) Concrete valve box, designated UST 70 (Refer to Section 3.1.6, IRWP, Rev. 0)

2) Two each, eight inch diameter jet fuel lines, between present termination points adjacent to tank mound and Bldg. 69 and Bldg. 70, respectively.

3) Fences and utilities as necessary to perform work scope in coordination with the affected activity. Specifically excluded from interruption of service by damage or other cause is the fire suppression deluge line to the bermed tank farm which must be operational at all times.

Where it is determined that utility lines cannot be rerouted or otherwise taken out of service, they will be located and marked as described in the IRWP and subsequently hand excavated, supported and protected during the remediation activities. Excavation of the existing retention pond northwest of the tank mound is not anticipated based on the limit of excavation described below.

Revise or action taken

Approximately 150 IDW drums and stockpiled drill cuttings are presently stored within the JP-5 spill area to be excavated. Bechtel will take no action involving handling and disposition of these materials without specific written authorization and instructions from the ROICC. Bechtel Safety and Health procedures and requirements will be applicable under these circumstances.

5.0 Soil Excavation and Initial Free Product Recovery

The modified scope of interim remedial action involves the removal of excessively contaminated soils from areas west and northeast of the bermed tank farm area. The objective of this work is unchanged: to remove significant quantities of soil acting as a source of contamination and to create an open excavation exposing the groundwater to aid in skimming free product. Excessively contaminated soils are defined as the 1000 ppm limits as discussed by the Navy in the preconstruction meeting of August 9, 1995. The volume estimates of soil to be removed and treated are on the order of: west side, 4350 yd^3; east side, 2550 yd^3. Assuming a density factor of 1.285 ton/yd^3, this yields an estimated 8870 tons of soils to be treated based on the assigned excavation depths described in Section 5.3 below.

5.1 Vertical Isolation Barrier and Free Product Recovery Trench

In accordance with the intent to maximize free produce recovery west of the bermed tank farm, the vertical isolation barrier will be installed in manner to contain and allow for recovery of free product between the tank mound and the soil excavation area. Schedule for installation will be confirmed in the field. After completion of barrier installation, a product recovery trench will be excavated immediately adjacent to and east of the barrier. This recovery trench will function as an intercept for any westward migration of product from the mound. If necessary, the recovery trench will be stabilized to ensure stability of the tank mound slope. The vertical barrier and recovery trench will provide a positive control of potential recontamination of the backfilled soil to the west by migration of product from the bermed tank farm.

5.2 Contaminated Soil Stockpile Construction

Excavated materials will be placed on an adjacent stockpile and will drain to the extent necessary for transporting. The stockpile area will be configured to provide drainage return to the excavation. Undrained "wet" soils directly from the excavation will not be transported outside of the construction zone.

5.3 Limit of Excavation

Limits of excavation for the areas west and northeast of the bermed tank farm are predetermined based on the mapped distribution of 1000 ppm contaminated soils, as measured by headspace analysis on the soil. The excavation limits were established and turning points staked onsite during the Bechtel/Navy working session of August 10, 1995; approximate excavation limits shown on Figure 1. (Excavation limits in the JP-5 spill area on Figure 1 reflect the

Misc

1) ~~Excavation depth on NE is open item as of 8-17; BK was to determine if 5 ft appropriate or if less would be ok~~

2) Apparently no known interferences on NE other than fence, wells to be saved and latteral controls imposed by drainage and tree line

3) Revised; rec'd ABB memo on excavation depths

NOTES ON JPS SPILL AREA

Excavation Limits

1) Established per working meeting w/ Brian Kizer 8-10-95 and followup phone call from him 8-11-95 - See drawing notes
2) Northeast security fence at mound must remain in place; excavation limit placed at 3ft out from fenceline
3) Per ROICC: excavation limits cannot be closer than 15 ft from pine tree stands in uncleared areas
4) Consequence of 3): available work area in narrow strip to south between fence and trees is very limited. Some brush clearing required adjacent to trees. Sequence of excavation will probably require backing out in this direction
5) Area within limits includes:
   - ~135 drums filled and empty
   - 20 x 40 cuttings stockpile
   - piles of cleared brush/wood
   - stumps in place
   - trees in place (small, regrowth)

   No actions w/o specific authorization per ROICC; inventory & characterization probably required.
6) As staked, limit along north side ditch typically about 12 ft off of edge of bank; bank is irregular in places.
7) Reported that in storm, water in ditch can come up 3-4 ft rapidly; committed to control surface flow either direction, ditch/excavation
8) Six monitoring wells w/in or adjacent to excavation limits are to be maintained through excavation and backfill per SOUTHDIV - See drawing notes.

Fencing

1). Two segments of security fence per SOUTHDIV layout
   - West: N-S segment vicinity of CEF-JPS-13, between existing security fence and

drainage ditch, ≈30-35 ft. NOTE - There is vehicle barricade further to west toward Ave A, between fence and ditch

- South: E-W segment south of vicinity CEF-076-05, between existing security fence and unspecified distance into wooded area, say 50 ft total (≈ 20 ft into woods)

2) Construction fencing around any excavated area; no other fencing required in SOUTHDIV layout at this time

Product Recovery

1) Initial excavation target area within free product plume - See drawing
2) Distance from center of free product area (say CEF-076-33) along fence, through culvert under access to mound, to open area near Bldg 285 = ±970' say 1000 ft from open excavation to separator location.
3) Power to NE area for skimmer pump(s) - require additional local generator (?)
4) Or ? Additional tankage for skimmer discharge to be located w/in NE controlled area.

Decon

1) ? Is area outside controlled work area, but inside controlled access fuel farm considered clean for truck haul purposes? If so, east side decon set up needed at exit, as on west.

present tree line.) Surveyed coordinates and elevations for the staked turning points are provided on the attached Table 1. It is recognized that areas exceeding 1000 ppm may occur beyond the designated limits of excavation.

The general guidelines for excavation depths are based on the distribution of contamination in the soil and the March 1994 data on free product distribution and groundwater levels. Within the free product plume west of the bermed tank farm, the soil will be excavated to the depth of five feet below ground surface. Elsewhere within the excavation limits, the soil will be excavated to one foot below the water table. Soil within the free product plume northeast of the bermed tank farm will be excavated to three feet below ground surface. Elsewhere within the limits of excavation, the soil will be excavated to a depth of one foot below water table.

Free product and groundwater levels will be measured in the construction areas prior to the decommissioning of designated monitoring wells to establish target excavation depths where they are based on ambient groundwater levels.

Certain general guidelines apply to excavation operations.

- Excavation limits will encroach no closer than 15 feet from existing timber stands adjacent to the cleared zone at the JP-5 spill site. Should any additional clearing be required to facilitate the necessary construction activities, it will be identified to the ROICC for prior approval.
- Excavation limits will encroach no closer than three feet from the northeast security fence which is to be maintained in place at the JP-5 spill site.
- Existing monitoring wells within or immediately adjacent to the excavation that are not identified for abandonment in Section 3.0 will be maintained and protected by means of suitable margin of natural soils left in place during excavation and backfill.
- Excavations limits will not encroach upon the retention pond or adjacent stormwater runoff control ditches. The established west side excavation limits are well removed from these features and all work and support activity will avoid these areas. Northeast of the bermed fuel farm, the excavation limits will encroach no closer than 12 to 15 adjacent to the northside drainage ditch.

5.4 Method of Excavation

Configurations of initial excavations and scheduling of related activities in both work areas are to be established so as to facilitate free product recovery in the open excavation. It is anticipated that this effort will be controlled in large part by field conditions and monitored performance of recovery operations.

The basic approach to excavation on both the west and northeast sides will be to initially open a trench to the appropriate assigned depth across the area of free product plume. This trench will then allow for drainage and recovery of product by skimmer pump. Width of this trench will be determined by the available space and the necessity to restrict surface area of the exposed standing water in order to facilitate free product recovery. Once the drain excavation is established, excavation of soil above the ambient water table will proceed elsewhere within the established excavation limits. In all excavation operations, saturated spoils will be allowed to drain on an HDPE-lined surface back into the open excavation before transport to the treatment facility. Once the extent of free product recovery is determined by the Navy, and Bechtel is directed to cease free product recovery by skimmer, the balance of the planned soil excavation, treatment and backfill will proceed.

Free product discharge to ground surface has been observed along a portion of the tank mound's northeastern sideslope in an area adjacent to the planned excavation. Runoff control and the excavation margin will be configured to capture such runoff in the product recovery excavation. Any further action regarding the product-contaminated tank mound fill material in this area will be require Bechtel/Navy coordination.

The limits of excavation defined on Table 1 represent the top of cut slope. Cut slopes are to be configured so as to maximize excavation volume while maintaining stability and safety. Anticipated minimum cut slopes are at 2 horizontal to 1 vertical.

6.0 Stormwater, Erosion, and Sedimentation Control

Surface flow across all areas adjacent to the excavation will be controlled and directed to prevent the collection of surface runoff in the excavations. This will be accomplished by grading and positive controls around the excavation perimeter. In addition, Bechtel will evaluate the post-construction requirements and options to control surface flow in the areas not to be excavated in the area west of the tank mound. In particular, the area north of the excavation which is presently drained by a storm drain to be partially removed will be addressed. Runoff control in this area may be accomplished by regrading and sloping toward existing drainage channels or by reinstallation of the storm drain and collector. These steps will be coordinated with the Navy.

In the northeastern construction area, Bechtel will take all necessary measures to control surface flow in either direction between the adjacent drainage ditch and the excavation. This may include, but is not necessarily limited to, berms, silt fences, and visquene-covered excavation slopes.

Accumulation of water within excavations from direct rainfall, excavation slope runoff, and stockpile runoff will be controlled to prevent overtopping and release to ground surface. Options available to control water within the excavations include perimeter berms and sump pumps. Water pumped from an excavation will require treatment (by filter or separator, as appropriate), testing and approval by the Navy prior to discharge to the FOTW.

7.0 Transport Vehicle and Equipment Decontamination Facility

Vehicle decontamination will be performed at temporary facilities within the controlled construction zones west and east of the tank mound. The existing truck rack will not be used as a temporary decontamination facility.

8.0 Material Haul Route

The planned haul route between the North Tank Fuel Farm construction zone and the thermal treatment facility at Site 3 will be from NTFF southward on 'A' Avenue, turning right onto 4th Street, across 'D' Avenue and continuing to Site 3. The return route for trucks to NTFF will be the reverse. Haul operations will be scheduled between the hours of controlled traffic and peak flow on 'A' Avenue. Should the need for crossing guards at intersections be determined, they will be provided.

9.0 Sampling and Analysis

The sampling program will be modified to conform to the present conditions of established excavation limits and depths. Because excavation limits are no longer controlled by concurrent soil sampling and headspace measurements, the scope of soil sampling will be reduced to provide a baseline condition at the end of interim actions. Soil samples for headspace analysis will be recovered at intervals of 50 linear feet along the completed excavation limits.

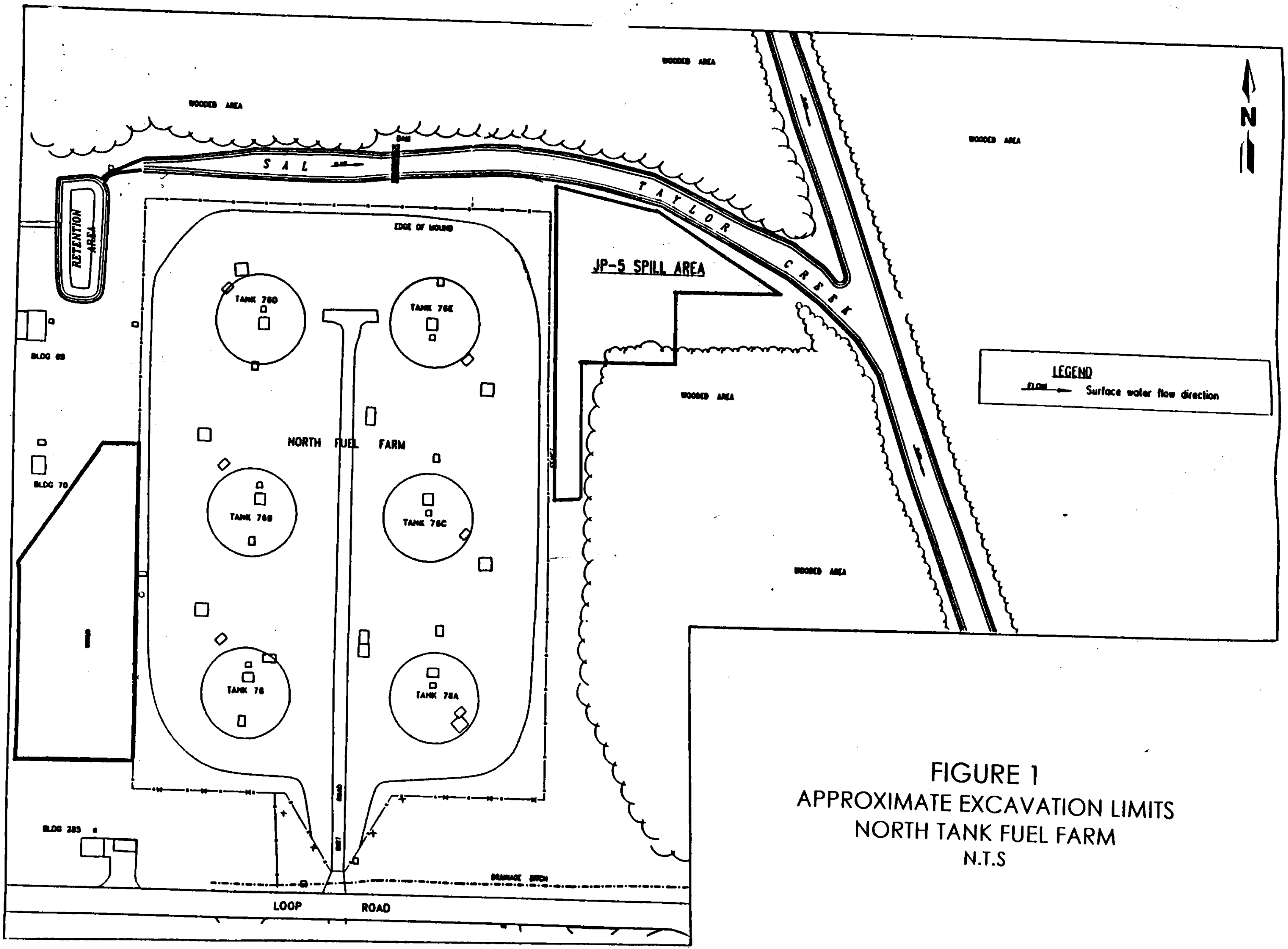


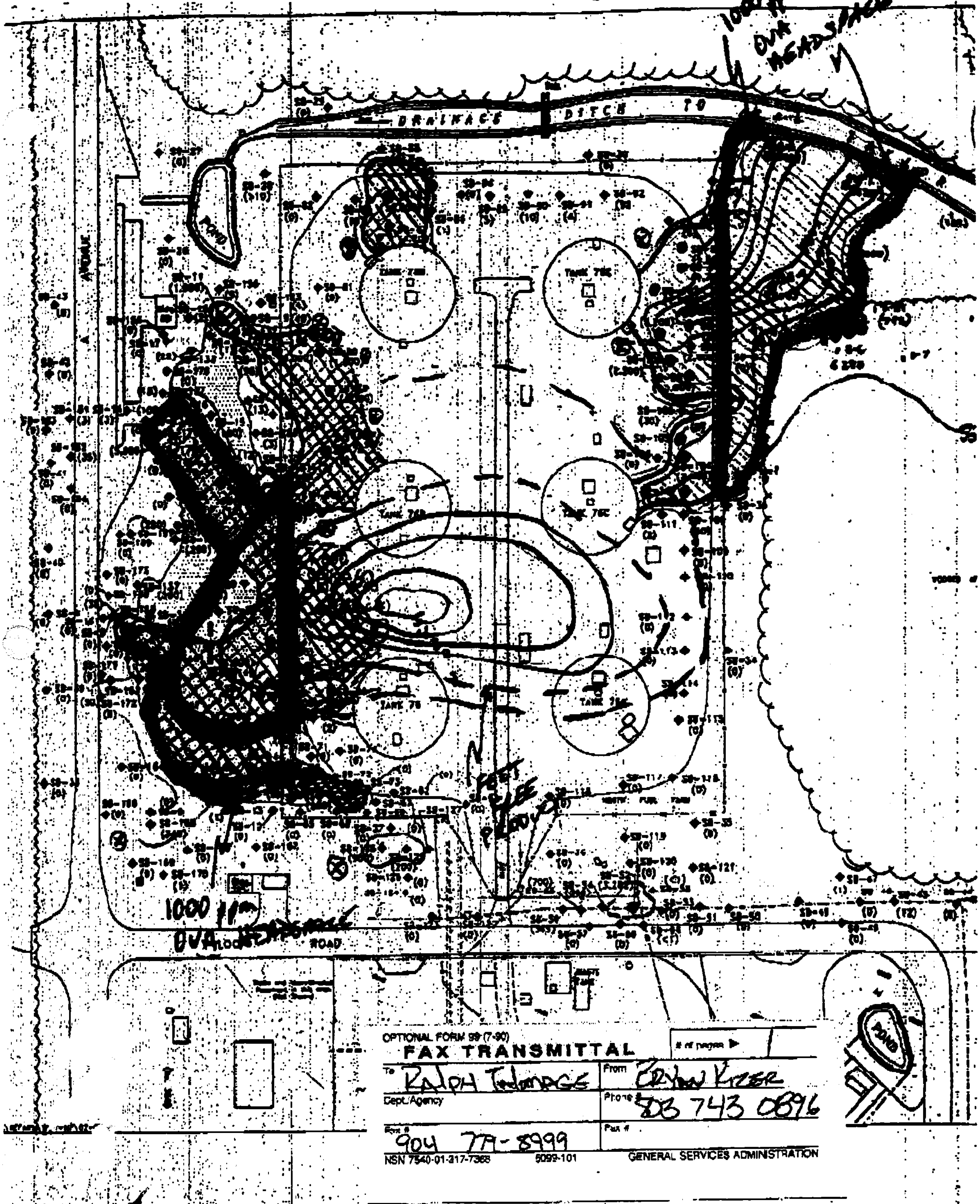
FIGURE 1
APPROXIMATE EXCAVATION LIMITS
NORTH TANK FUEL FARM
N.T.S

DRAFT

TABLE 1

EXCAVATION LIMIT SURVEY DATA

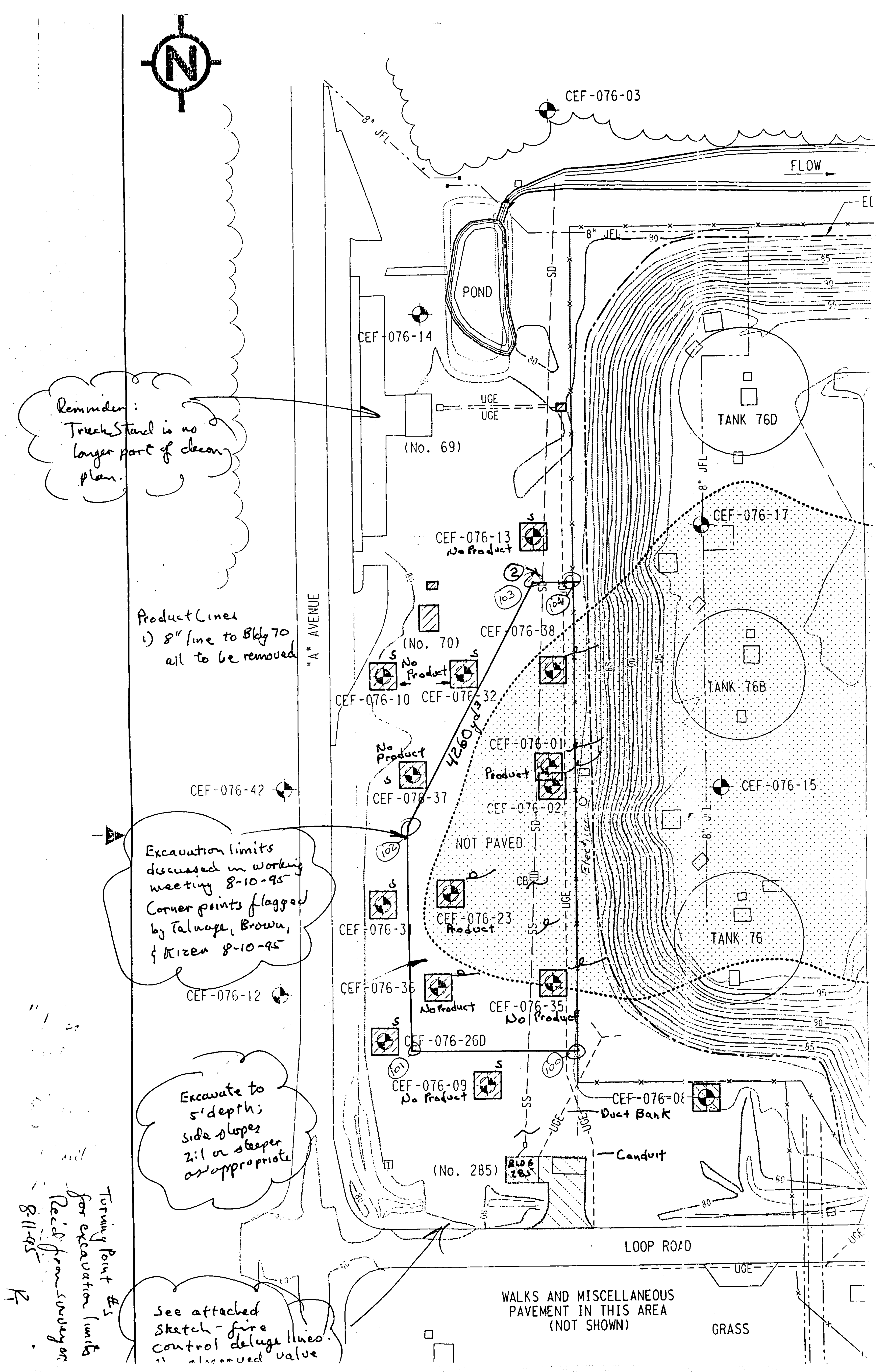
Turning Point #	Northing	Easting	Elevation
West Side			
100	5162.05	5203.65	81.0
101	5161.60	5101.42	80.4
102	5302.40	5100.12	80.2
103	5447.61	5181.27	80.1
104	5447.30	5203.88	80.6
East Side			
107	5680.25	5574.86	78.3
108	5667.42	5656.00	77.2
109	5640.61	5729.05	76.3
110	5593.69	5801.91	76.3
111	5600.43	5690.23	76.6
112	5533.71	5680.53	76.7
113	5538.29	5612.30	78.7
114	5404.23	5607.88	79.0
115	5406.89	5576.78	80.4

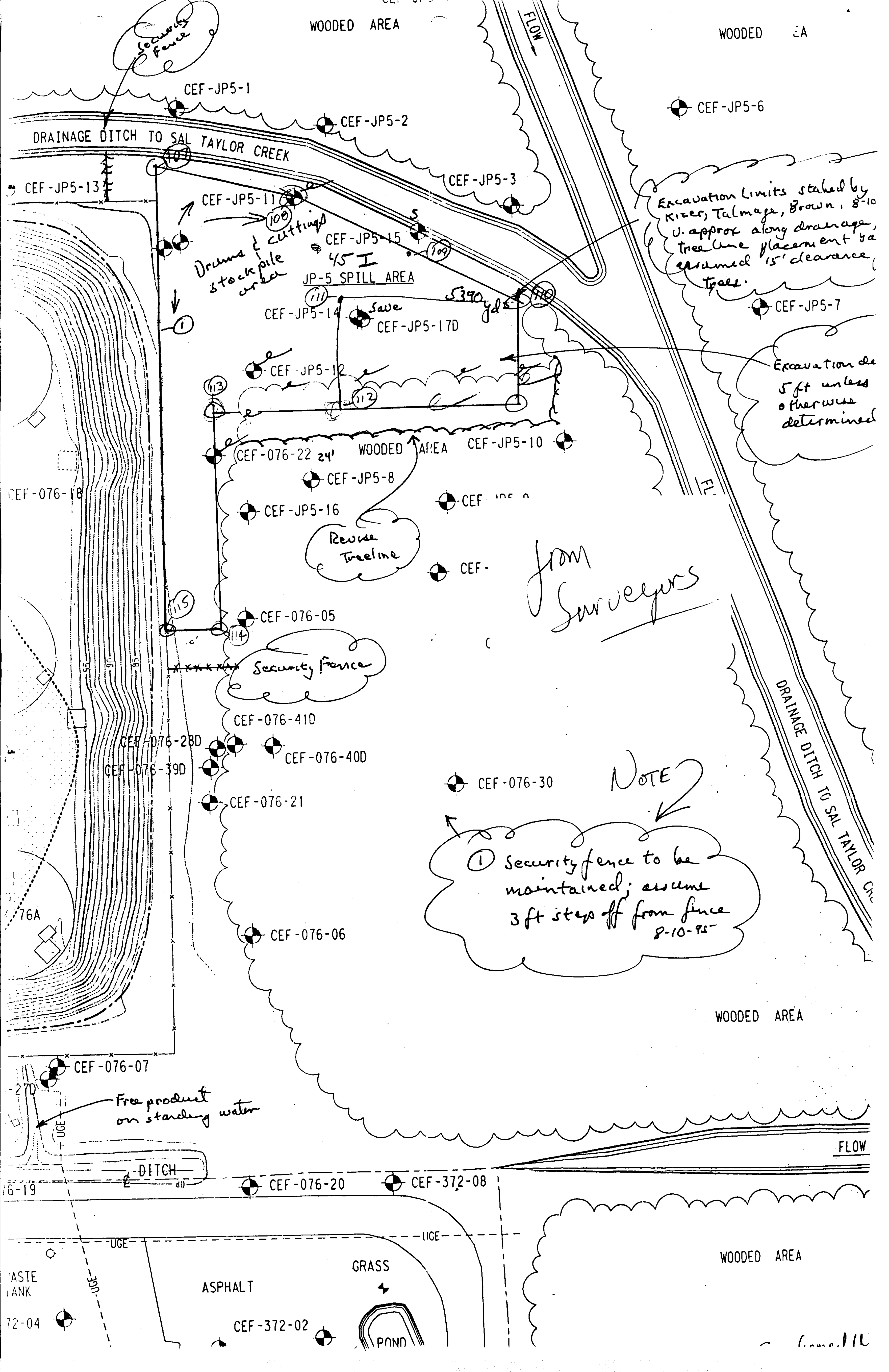


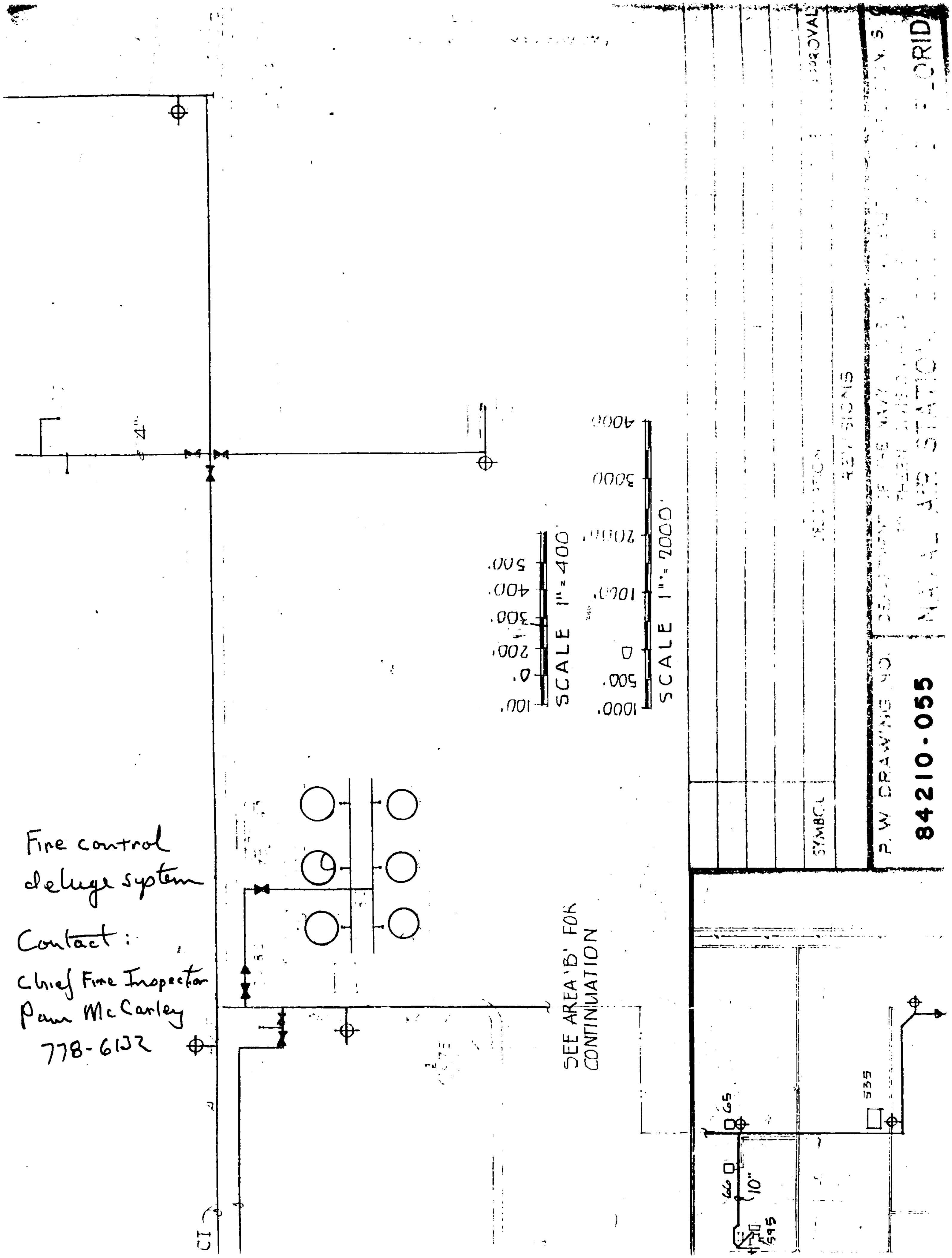
OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

# of pages ▶	
To Ralph Talmage	From Bryan Kizer
Dept./Agency	Phone # 803 743 0896
Fax # 904 779-8999	Fax #
NSN 7540-01-317-7368 5099-101	GENERAL SERVICES ADMINISTRATION


N
CEF-076-03
8" JFL
FLOW
EL
8" JFL
80
85
90
95
SD
POND
CEF-076-14
80
UGE
UGE
(No. 69)
TANK 76D
8" JFL
Reminder: Trench Stand is no longer part of clean plan.
CEF-076-17
CEF-076-13
No Product
2
103
104
SS
UGE
Product Lines
1) 8" line to Bldg 70 all to be removed
"A" AVENUE
(No. 70)
CEF-076-38
TANK 76B
No Product
CEF-076-10
CEF-076-32
4260 yd3
CEF-076-01
No Product
Product
CEF-076-02
CEF-076-42
CEF-076-37
CEF-076-15
8" JFL
NOT PAVED
Elect/Misc
102
Excavation limits discussed in working meeting 8-10-95. Corner points flagged by Talmage, Brown, & Kizen 8-10-95
CB
UGE
CEF-076-31
CEF-076-23
Product
SS
TANK 76
CEF-076-36
CEF-076-12
No Product
CEF-076-35
No Product
CEF-076-26D
101
100
CEF-076-09
No Product
CEF-076-08
Duct Bank
Excavate to 5' depth; side slopes 2:1 or steeper as appropriate
SS
UGE
UGE
Conduit
(No. 285)
BLDG 285
80
LOOP ROAD
UGE
UGE
WALKS AND MISCELLANEOUS PAVEMENT IN THIS AREA (NOT SHOWN)
GRASS
See attached sketch - fire control deluge lines. 1) ... valve
Turning Point #1 for excavation limits Rec'd from surveyor 8-11-95
K


WOODED AREA
Security Fence
FLOW
WOODED AREA
CEF-JP5-1
CEF-JP5-2
CEF-JP5-6
DRAINAGE DITCH TO SAL TAYLOR CREEK
CEF-JP5-13
CEF-JP5-3
CEF-JP5-11
108
107
Excavation Limits staked by Kizer, Talmage, Brown, 8-10
U. approx along drainage, tree line placement ya assumed 15' clearance trees.
Drums & cuttings stockpile area
CEF-JP5-15
45 I
109
JP-5 SPILL AREA
5390 yds
110
111
CEF-JP5-14
Save
CEF-JP5-17D
CEF-JP5-7
1
Excavation de 5 ft unless otherwise determined
CEF-JP5-12
113
112
CEF-076-22 24'
WOODED AREA
CEF-JP5-10
CEF-JP5-8
CEF-076-18
CEF-JP5-16
Revise Treeline
from Surveyors
115
CEF-076-05
114
Security Fence
DRAINAGE DITCH TO SAL TAYLOR CR
CEF-076-41D
CEF-076-28D
CEF-076-40D
CEF-076-39D
CEF-076-30
NOTE
CEF-076-21
1 Security fence to be maintained; assume 3 ft steps off from fence 8-10-95
76A
CEF-076-06
WOODED AREA
CEF-076-07
-27D
Free product on standing water
UGE
FLOW
DITCH
76-19
CEF-076-20
CEF-372-08
UGE
WOODED AREA
GRASS
ASPHALT
ASTE ANK
72-04
CEF-372-02
POND



Fire control deluge system

Contact:
Chief Fire Inspector
Pam McCarley
778-6132

Surveyed ... Coordinated
Excavation Limits
Turning Points

			EL
100	N5162.0	E5203.6	81.0
101	N5161.6	E5101.4	80.4
102	N5302.4	E5100.1	80.2
103	N5447.6	E5161.3	80.1
104	N5447.5	E5203.9	80.6

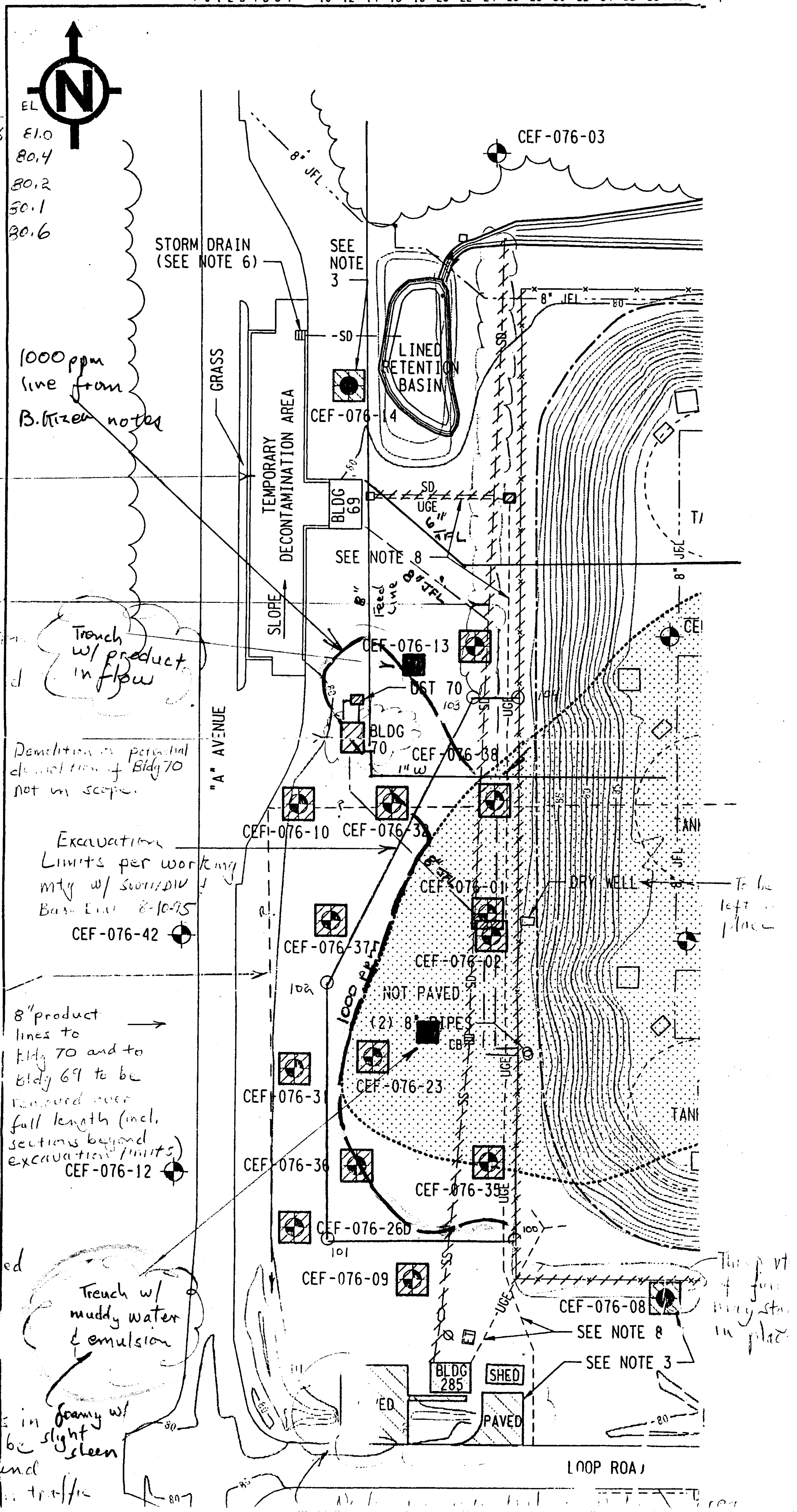
Truck stand ... not to be used as temp ...

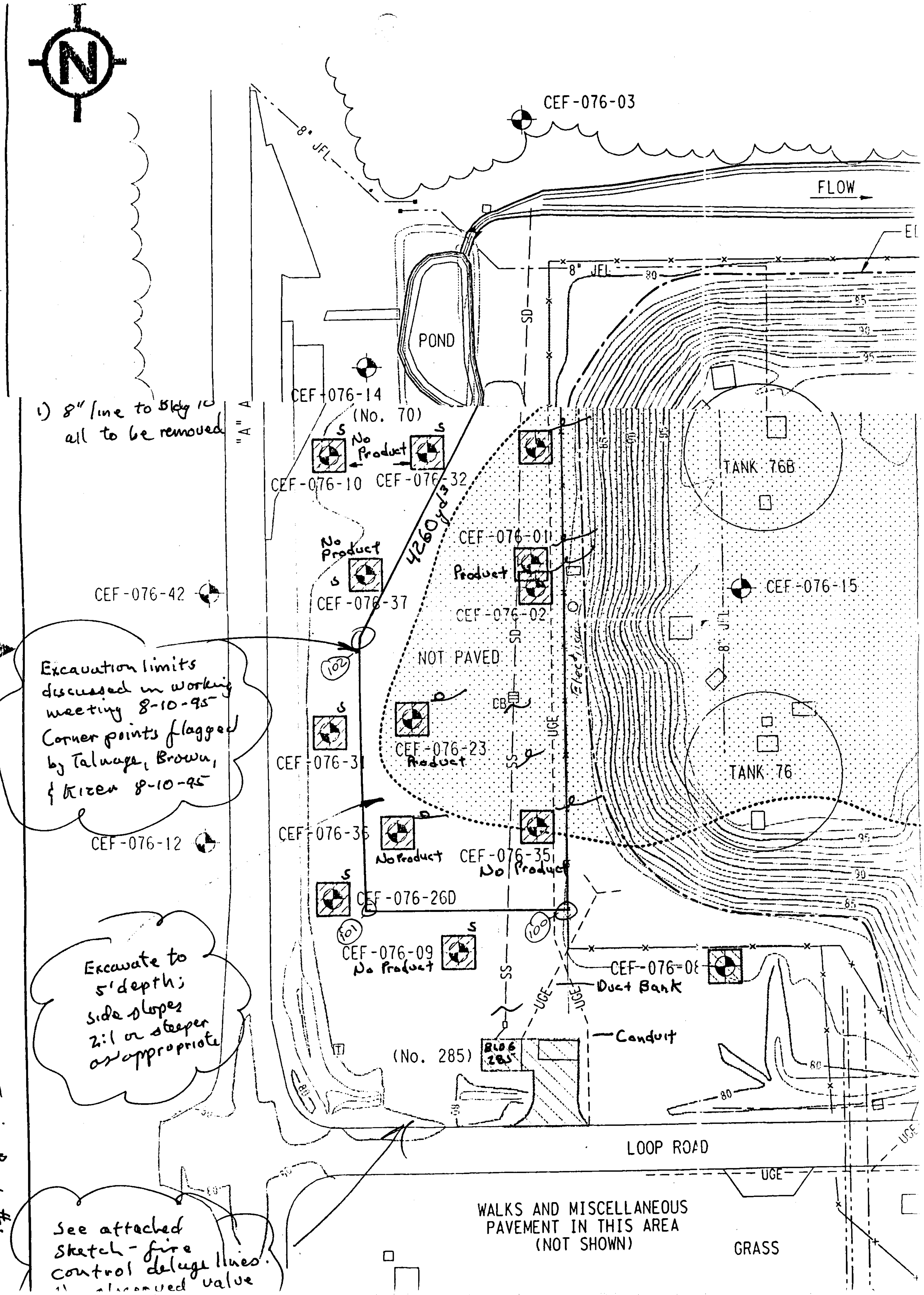
... North of excavation limits to be left in place; flanged and capped ... reinstalled ... determined in field.

Deluge system fire line MUST be maintained. Fire line must be located prior to excavation

Monitoring Wells to be abandoned
CEF-076-01
-02
-35
-35
-36
-38

All other wells in the area to be maintained and protected from traffic

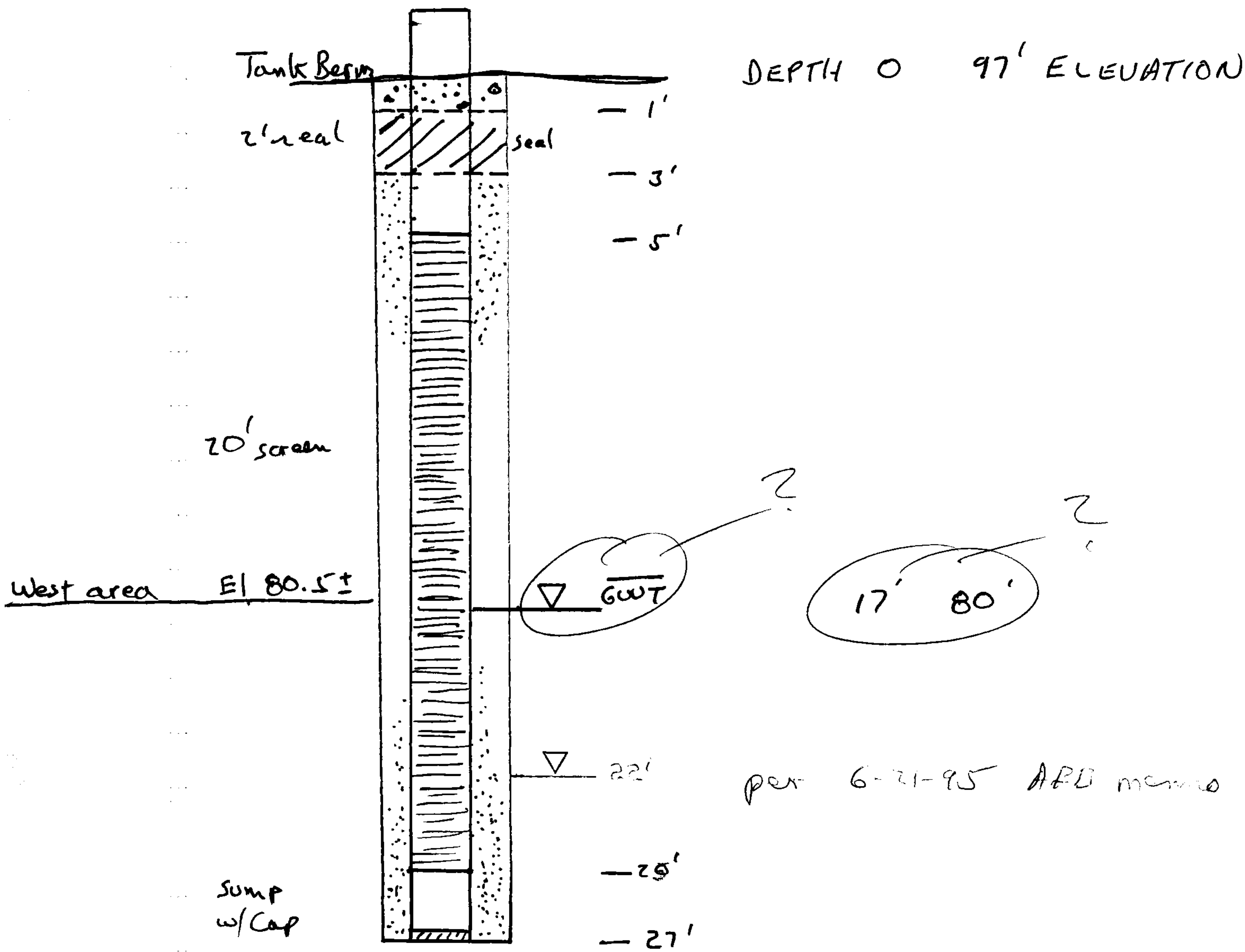




Turning Point #1 for excavation limits Rec'd from surveyor 8-11-95

K

BIOSLURP WELL



If design Q per well = 0.2 gpm

then system flow = 0.4 gpm (2 wells)

0.4 gpm = 576 gal/day

assume water/product ratio = 30:1 (per ABB)

then daily flow = 19 gal product
557 gal water

---

gradient from ABB trench/flow calc = 0.0046 ft/ft
← "normal"

→ if they assumed trench 5' west of fence then distance trench to well 15 would be, say, 97'

→ w/ gradient of 0.0046 ft vertical variation over 97' laterally would be 0.45'

If level @ well 15 <u>one foot</u> higher than at trench, gradient = 0.0103
and product flow =

NEXT PAGE → ?

Well

- confirm schedule
- confirm construction
- [illegible] storm [illegible]

1) Site 17 – handling water

[illegible] 12 ppm target – to MCL – where from?

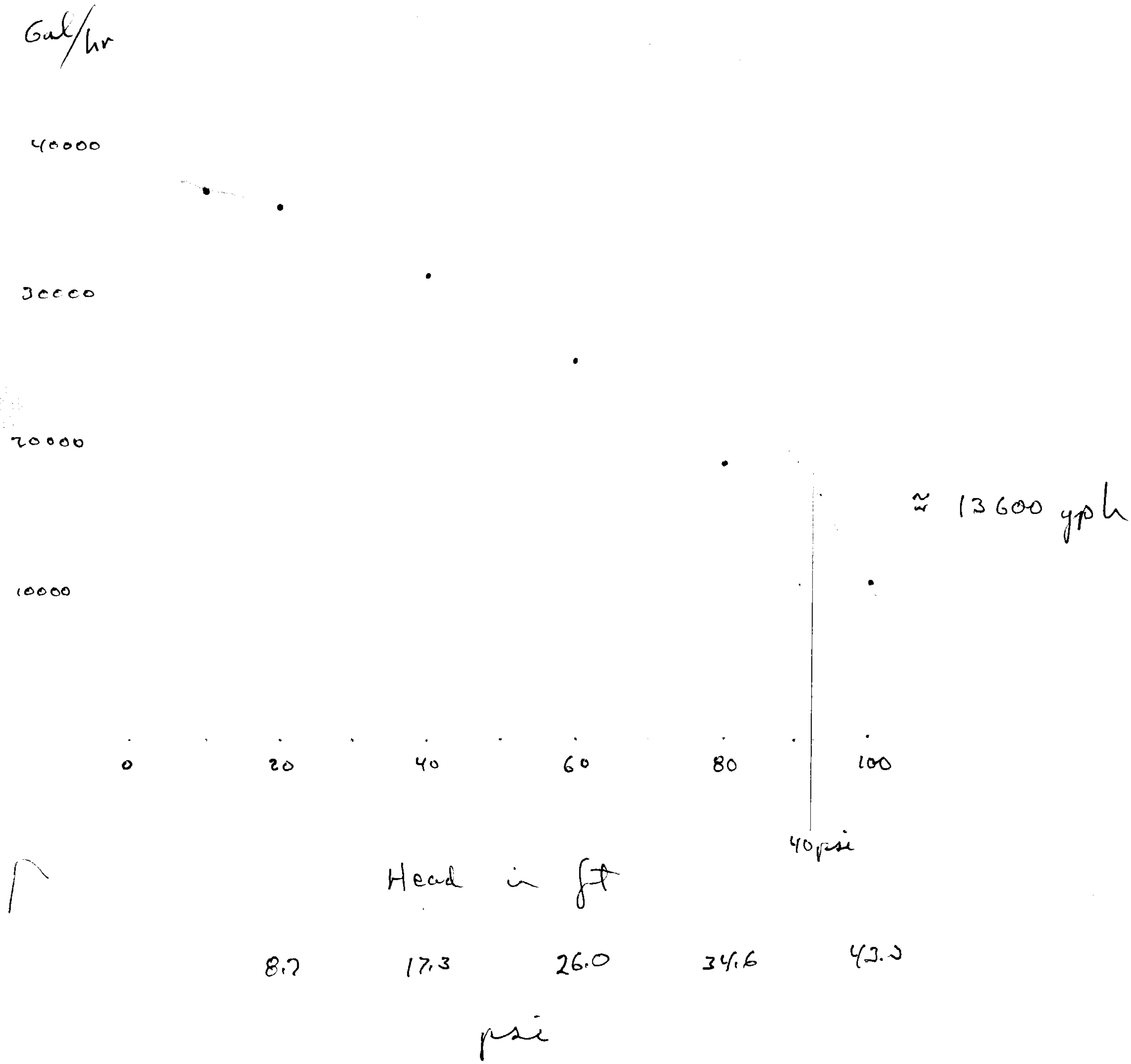
↳

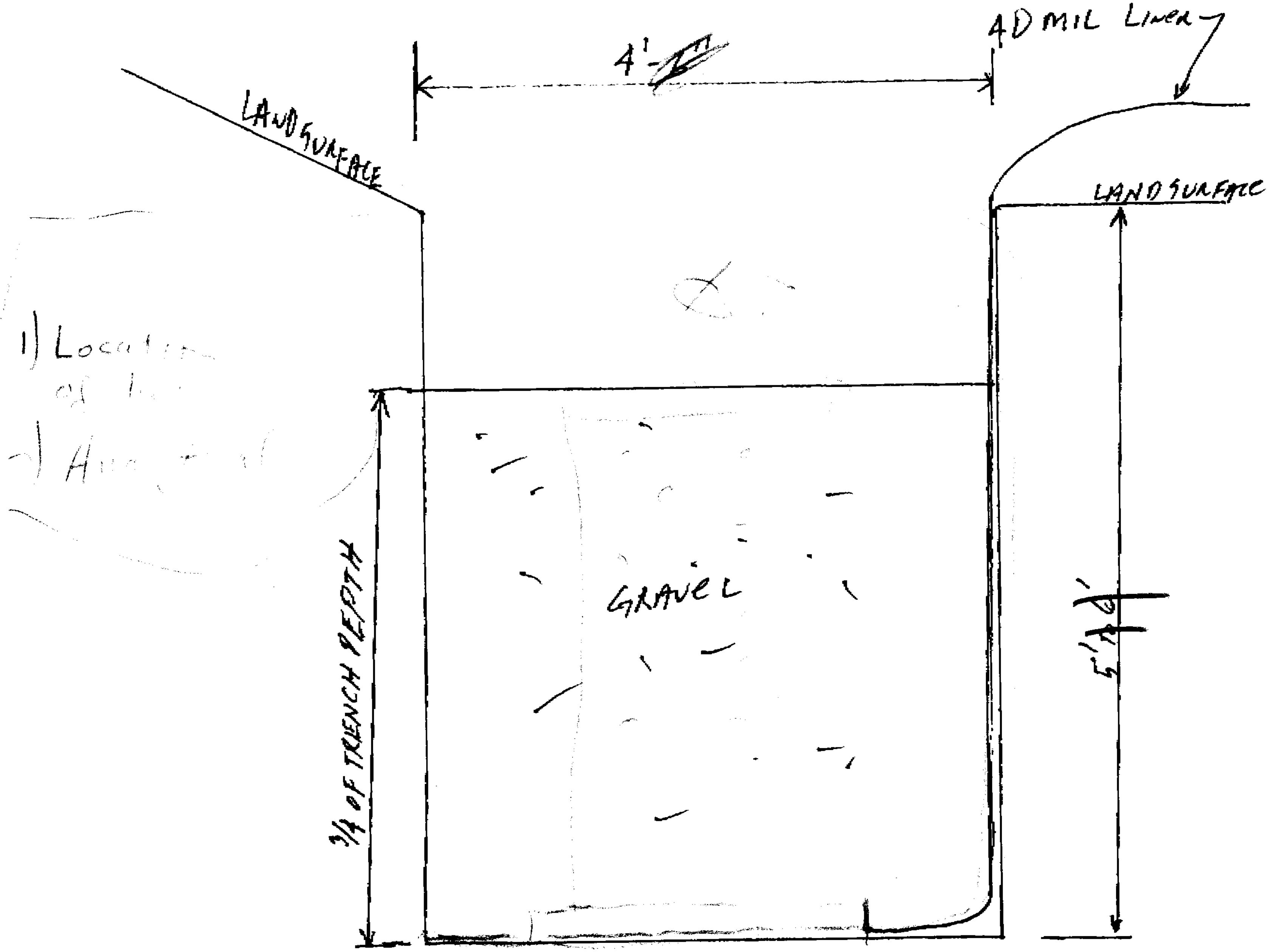
Bechtel

Calculation Sheet

Originator ______ Date ______ Calc. No. ______ Rev. No. ______
Project ______ Job No. ______ Checked ______ Date ______
Subject ______ Sheet No. ______

75 gpm = 4500 gph




40 MIL Liner
LANDSURFACE
LANDSURFACE
GRAVEL
3/4 OF TRENCH DEPTH

$KIA = Q$

$K = 0.53$ ft/day for Kerosene
$I = 0.0103$ ft/ft
$A = 57.96$ ft^3 using ABB #s

$Q = (0.53)(0.0103)(57.96)$ ft^3/day

$Q = 0.3164$ ft^3/day

$Q_{gal} = Q \times 7.481$

$Q_{gal} = 2.4$ gal/day

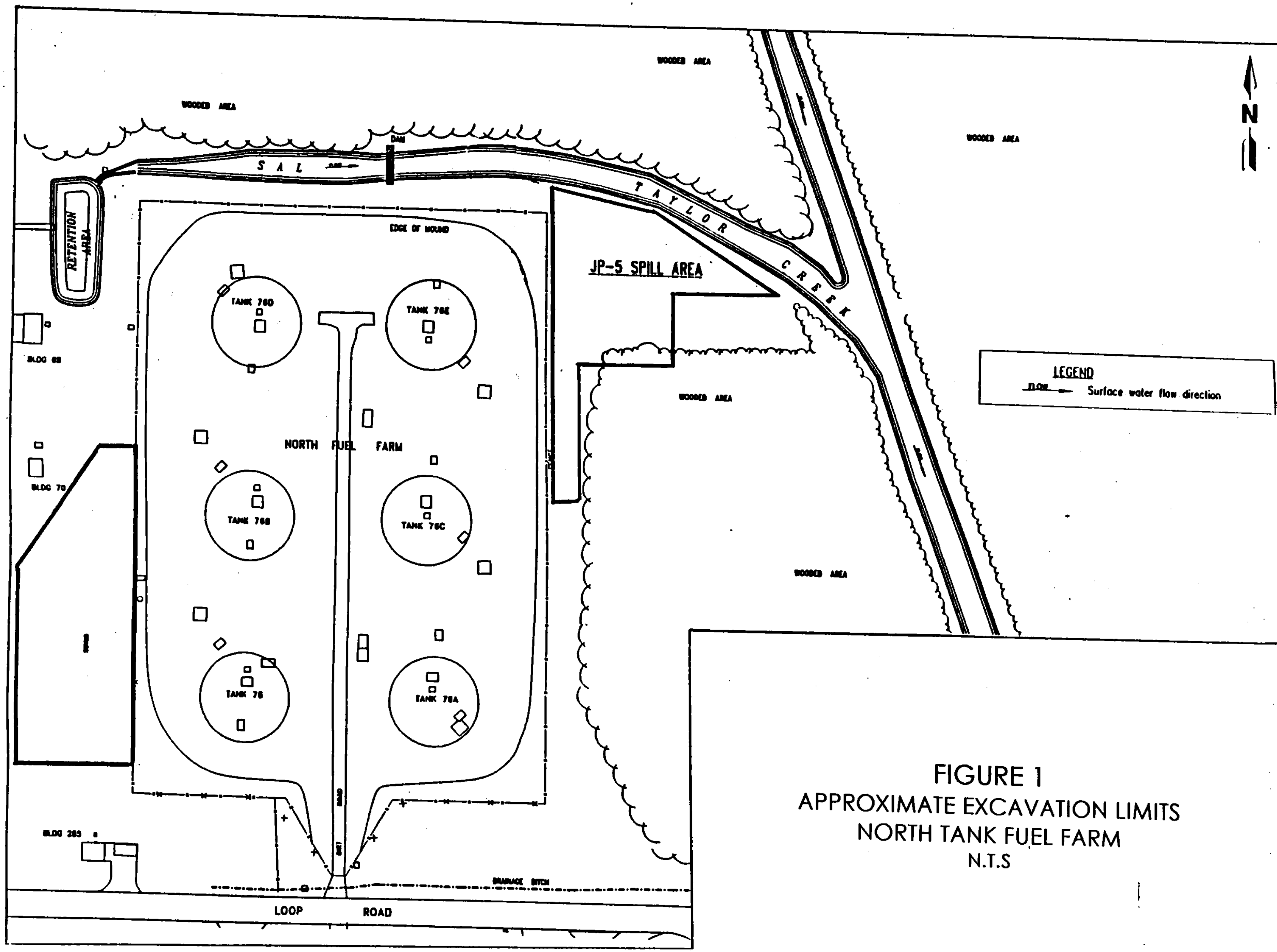


FIGURE 1
APPROXIMATE EXCAVATION LIMITS
NORTH TANK FUEL FARM
N.T.S

Rec'd from Miles Denham
SRS Technology Center
8-16-95

Environmental Horizontal Drilling Companies (7/19/94)

Compiled from *Industry Survey For Horizontal Wells: Final Report* -WSRC TR-93-511 and from those companies that responded to the RFP for drilling horizontal wells at the SRS

***Eastman Cherington Environmental Corp.**
1055 Conrad Sauer
Houston, TX 77043-5201

Contact: Carlos Kenda - 713-722-7777

UTILX Corporation
22404 66th Avenue S.
Kent, WA 98302

Contact: Michael J. Kirby - 206-395-4530

Michels Environmental Services
8415 Parfet Ct.
Arvada, CO 80005

Contact: Tim C. McGuire - 303-423-5761

Underground Research Inc.
4091 Camas Rd.
Camas Valley, OR 97416

Contact: Frank Kinnon - 503-445-2425

S&S Harris and Associates
Box 2550, Route 2
Cushing, OK 74023

Contact: Sam Harris - 918-225-5695

Horizontal Wells/Division of H.D.S.I.
P.O. Box 150820
Cape Coral, FL 33915

Telephone: 813-995-8777

Horizontal Drilling International
3430 Rogerdale Road
Houston, TX 77042-5016

Contact. David May - 713-785-3369

SlimDril International, Inc.
4723 Pinehurst Drive
P.O. Box 924328

Houston, TX 77292-4328

Telephone: 713-957-0727

Drilex Systems, Inc.
15151 Sommermeyer
P.O. Box 801114
Houston, TX 77280-1114

Telephone: 713-937-8888

Drilled Crossings, Inc.
P.O. Box 486
Arnaudville, LA 70512

Contact: John E. Richard - 318-754-7802

***Charles Machine Works, Inc. (Ditchwitch)**
P.O. Box 66
1959 West Fir
Perry, OK 73077-0066

Contact: Roger Layne - 405-336-3591

Tom Allen Construction Company
6218 Miller Drive
Edwardsville, IL 62025

Contact: Dennis C. Stromberg - 618-656-3059

Western Utilities Inc.
580 Spice Islands Court
P.O. Box 50415
Sparks , NV 89435 0415

Contact: Curtis Rosc - 702-331-1191

* Drilled and installed horizontal wells at the Savannah River Site (Eastman Cherington is the result of a merger between Eastman Christensen Evironmental Systems and Cherington Environmental Corporation, each of which drilled and installed horizontal wells at the Savannah River Site).

Added 8/16/95

Southern Diversified Technologies, Inc.
P.O. Box 15552
Panama City, FL 32406

Contact: James R. Ezell, Jr. - 904-235-4808

GTS Inc. & GTS Horizontal Drilling Co., Inc.
1231-B East Main Street, Suite 189
Meriden, CT 06450-1019

Contact: 203-238-4567

McGinnis Drilling
634 West Clarks Landing Rd.
Egg Harbor, NJ 08215

Contact: Mr. Mark McGinnis